This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

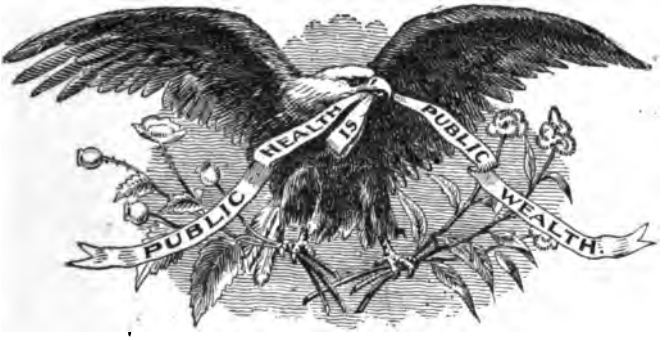
THE

SANITARIAN,

A MONTHLY MAGAZINE

DEVOTED TO THE

PRESERVATION OF HEALTH, MENTAL AND PHYSICAL CULTURE.



VOLUME XXXVIII., JANUARY TO JUNE.

A. N. Bell, A.M., M.D., Editor.

T. P. Corbally, A.M., M.D., }
Harry Kent Bell, M.D., } Associate Editors.

BROOKLYN, N. Y.: A. N. BELL,
1897.

BOSTON MEDICAL
AUG 12 1899
LIBRARY.

Entered according to Act of Congress, A. D, 1897, by A. N. BELL, in the office of the Librarian of Congress, at Washington.

CATALOGUED
AUG 12 1899
E. H. B.

7233.

BOSTON MEDICAL
AUG 12 1899
LIBRARY.

THE SANITARIAN.

JANUARY, 1897.

NUMBER 326.

STATE MEDICINE IN PENNSYLVANIA.*

BY BENJAMIN LEE, M.D., SECRETARY OF THE STATE BOARD OF HEALTH.

The last Legislature having passed a number of laws affecting directly the administration of local boards of health, it became the duty of this Board to acquaint them with the additional powers thus conferred upon them and to indicate the readiest means of carrying these laws into effect. Accordingly the Secretary addressed a circular letter to the secretaries of 526 local boards of health in the State, calling their attention to the new duties thus assigned them and the coincident amplification of their authority. The following acts were reprinted and freely circulated, not only among health authorities but also through the medium of the public press, in order that the general public might become familiarized with the fact that the law imposed duties upon them as well as upon health boards and health officers, and in that way be induced to comply with less reluctance with the orders of the local health authorities:—

Act No. 107, entitled "An Act to provide for the better protection of life and health by diminishing the danger from infectious and contagious diseases through the creation of a State Board of Undertakers in the cities of the first, second and third classes, with systematic examinations, registration and licenses for all entering the business of burying the dead and penalties for the violation of the provisions thereof."

Act No. 124, entitled "An Act to provide for the more effectual protection of the public health in the several municipalities of this commonwealth."

*Abstract of the Twelfth Annual Report of the Secretary of the State Board of Health, November 12th, 1896.

Act No. 133, entitled "An Act authorizing the boards of health in the cities and boroughs of this commonwealth to regulate house drainage, the registration of journeyman and master plumbers and the construction of cesspools."

Act No. 165, entitled "An Act to promote cleanliness and healthfulness in and about the public schools of this commonwealth."

Act No. 263, entitled "An Act for the prevention of blindness, imposing a duty upon all midwives and other persons having the care of infants, and also upon the health officer, and fixing a penalty for neglect thereof."

Forms were prepared and distributed to the various local boards of health requiring the registration of undertakers, master plumbers, journeyman plumbers, nurses and midwives; vaccination of school children; reports of contagious diseases by physicians; certificates of recovery and disinfection from physicians; certificates of successful vaccination by physicians; and health officer's notification.

The Act for the better protection of the public health originated with some of the oldest and most experienced municipal health authorities in the State, and represents the results reached by long years of practical work. It constitutes, in fact, a sanitary code for the restriction of epidemic diseases, and was issued by the Board under this title. It is equally operative for every portion of the State, the boards of health of cities and boroughs being required to enforce its provisions within the limits of their several jurisdictions and the State Board of Health in all districts and places having no health authorities of their own. Its value lies principally in two facts: first, that it makes sanitary administration, so far as the suppression of epidemics, including the enforcement of domiciliary quarantine, disinfection and the vaccination of school children, are concerned, uniform throughout the State; and, secondly, that it authorizes boards of health to enforce its provisions, independently of municipal regulations.

The Act authorizing and requiring boards of health to regulate drainage in cities of the third class and boroughs, places the plumbers under the direct supervision of the health authorities, requiring the former to take out licenses in order to be allowed to follow their trade.

BLINDNESS AND ITS PREVENTION.

The Act for the Prevention of Blindness is founded upon the following facts:—

1st. There is in the State of Pennsylvania, as in the United States, an apparently rapid increase in the number of the blind.

2nd. A large percentage of the blindness is due to the disease known as purulent ophthalmia of the new born.

3rd. By the use of known methods this could be very materially lessened.

When we compare the report of the United States census of 1870 with that of 1880 we find that the increase of population for Pennsylvania for that period was 21.6 per cent., while the apparent increase in blindness for the same period was 119.8 per cent., showing that blindness increased over five times more rapidly than the population.

A single disease, ophthalmia of the new born infants, the most productive cause of blindness.

In the second place, the most important factor in the production of blindness is the purulent ophthalmia of infants, or ophthalmia neonatorum. Fuchs found that among 3,204 cases of blindness collected from asylums in different parts of Europe 23.5 per cent. were due to ophthalmia neonatorum. In the New York Institution for the Blind, at Batavia, 23.4 per cent. of the inmates were there as the result of the same disease.

Horner has shown that among 100 blind asylums in different countries the variation was from 20 to 79 per cent.—average, 33 per cent.

Haussmann gives the number in the asylum in Copenhagen made blind by this disease as 8 per cent., in Berlin 20 per cent., in Vienna 30 per cent., in Paris 45 per cent.

According to the report of the Royal Commission on the Blind, of the English Government, published in 1889, 30 per cent. of the inmates of the institutions and 7,000 persons in the United Kingdom have lost their sight from this cause.

Professor Magnus, of Breslau, finds that no less than 72 per cent. of all who become blind during the first year of life are rendered so by purulent ophthalmia; and even of those who become blind before the twentieth year of life, it constitutes as much as 23.50 per cent. Looking at the subject in another way he shows that of 10,000 children under five years of age, 4.28 are blinded by purulent ophthalmia. In the blind asylums of Switzerland the proportion who have lost their sight from this disease is 26 per cent., in the asylums of Austria, Hungary and Italy about 20 per cent.; while in Spain or Belgium it falls to about 11 or 12 per cent. An investiga-

tion into the causes of the blindness of 167 inmates of the Pennsylvania Institution for the Blind, made by Dr. George C. Harlan, of Philadelphia, developed the fact that 55 owed their affliction to purulent ophthalmia, and that more than half of these cases occurred in infancy.

Ophthalmia of the new born is an infectious, and therefore a preventable disease.

Whenever the fact is demonstrated that a disease is infectious, contagious, communicable from person to person, either by direct contact or through the medium of infected articles, it becomes the duty of the physician and the sanitarian to discover, if possible, the source and character of the infectious matter, and to devise means for preventing its transmission.

Ophthalmia of the new born is an infectious disease, and can only occur after infectious matter has come into actual and somewhat prolonged contact with the eye.

As regards the period when infection occurs, this may take place either during or immediately after birth, or at some subsequent moment. If the former, the disease manifests itself by redness and puffiness of the lids at from the second to the fifth day; if it does not appear until later, infection has taken place subsequent to birth.

It is hardly too much to say that *no one should become blind from this disease;* not only because it is quite amenable to treatment, if this be instituted from the beginning, but because the disease itself can be prevented in most instances if those who have the care of mother and child understand the nature of the affection.

From the facts above given it will be seen that this is simply another way of saying that *one third of those who are now blind might have been saved from this calamity.*

The precautions necessary to prevent ophthalmia of the new born and resultant blindness, now adopted by scientific physicians, comprehend the plan known as "the Crede method," from the name of the physician who introduced it. It consists in first carefully washing the eyes of the child with pure warm water, and then droping into them one or two drops of a two per cent. solution of nitrate of silver. The proof of the good results of this simple precaution is overwhelming.

Dr. Lucian Howe, of Buffalo, has collected two lists of cases, the first showing the result obtained and published by different obstetricians who used no treatment for the eyes of 8,798 children

born under their care. Among these 8.66 per cent. had ophthalmia in a greater or less degree.

The second list of 8,574 shows the result of the Crede treatment. In these cases there were only 0.65 per cent. In the lying-in hospital of Beipsic, where Crede instituted his own method, the percentage fell from 7.5 to 0.5 per cent. The advantages of Crede's method have been recognized by its official recommendation in Austria, Germany, Switzerland, France, and in this country.

Necessity for special instruction of Nurses and Midwives.—In view of these incontrovertible facts it becomes the duty of all physicians who are engaged in the instruction of nurses and midwives, under whose care rather than that of the thoroughly qualified physician these cases are apt to occur, to impress upon them the terrible risks incurred by neglect of cleanliness in this particular, and to require of them an intelligent appreciation of the importance of the subject and an acquaintance with the signs of commencing inflammation of the eyes and of the methods above detailed.

This class of attendants on lying-in women should not, however, attempt to conduct the prolonged treatment of a case of inflamed eyes of the new born infant by themselves, but should place the case under the charge of a physician at the earliest possible moment.

Deeply impressed with the importance of this subject and feeling the responsibility which rested upon it to use its authority for the diminution of this serious disability, the State Board of Health in the year 1892 adopted a regulation requiring that, whenever in any city, borough, village or place in this State having no health authority of its own, any nurse midwife or other person, not a legally qualified practitioner of medicine, should notice inflammation of the eyes or redness of the lids in a new born child under his or her care, it should be the duty of such person to report the same to some legally qualified practitioner of medicine, within twelve hours of the time the disease was first noticed.

This regulation has now been superseded by the Act under consideration, which requires the nurse or midwife to report to the health officer within six hours after discovery of the symptoms of the disease, when that officer shall at once send directions for the treatment of the case.

In pursuance of the purposes of this Act, the Secretary has issued the following form as a guide to health officers in the discharge of the duty assigned to them:

State Board of Health Model Form.
(F. 39.)
Health Officer's Notification,
Office of the Board of Health.

.....189

To..... No..... Street.

In accordance with Section 2 of the Act of June 26th, 1895, for the "Prevention of Blindness," it is my duty to notify you that the infant reported as having swollen or reddened eyes at your residence or under your care, is in great danger of losing its sight unless the following directions are carefully and fully complied with:

Directions to the Midwife or Nurse.

1. Gently open the lids and wash out the eyes with pure lukewarm water which has been boiled, using a clean soft piece of old linen or muslin or a pledget of absorbent cotton, *not* a sponge.

2. Then immediately drop into each eye one or two drops of two per cent. solution of nitrate of silver. The appended prescription for this solution may be cut off and sent to the apothecary.

3. Half an hour later wash out the eyes with warm salt and water, (a teaspoonful of table salt to a pint of boiled water) or with a solution of boric acid (ten grains to two tablespoonfuls of boiled water) and continue this last application every hour or two until the eyes are well, gradually lengthening the time.

This disease is very catching and very dangerous even to grown up persons. Therefore boil or burn all cloths that have touched the eyes, avoid kissing the child, wash your hands after bathing the eyes, and allow no one else to use the same basin.

Official prescription authorized by the State Board of Health:

R Argent. nitrate. cryst.....gr. i.
Aq. Destillat .....M L.
Ft. solutio.
Sig. Drop one or two drops into each eye, *once only.*
For external use only.

.....Health Officer.

BACTERIOLOGICAL LABORATORY.

The effort of the Board to obtain an appropriation for the establishment of a Bacteriological Laboratory having been unsuccessful, it became necessary to devise some means for supplying this de-

ficiency in respect to a department now recognized as essential by every progressive State Board of Health, as well as by those of large cities. An arrangement has therefore been entered into with the Assistant Bacteriologist, Dr. R. L. Pitfield, by which his private laboratory in Philadelphia shall be designated as the "Bacteriological Laboratory of the Board," the latter engaging to bear a certain portion of the expense of maintaining and conducting the same.

Diphtheria in many cases, especially in its early stages, can only be diagnosticated by means of a microscopical examination, and this only after the germ of the disease has been properly cultivated.

Moreover, in many instances, diphtheria has been contracted from cases apparently recovered. After the membrane disappears from the throat the germs often persist many days, and the patient, although to outward appearances well, can continue to transmit the disease to others. A bacteriological examination will determine this point to a certainty. Local Boards of Health should therefore make it a rule not to raise quarantine in cases of diphtheria until a bacteriological examination has proved the absence of infecting germs from the throat of the patient. This precaution is now taken in most of our large cities with excellent results. The Board has long felt that there is no good reason why residents of small towns, or even of rural districts, should not enjoy similar protection. It has therefore made arrangements by which it is able to extend to physicians throughout the State similar facilities to those furnished by local Boards in large cities for this purpose.

In order to do so it was necessary to apply to the U. S. Postmaster-General for a modification of the order of his department forbidding the transmission of diseased tissues through the mails. This request was granted with the proviso that a certain form of mailing case of great strength and germ proof be used. For specified rates, proportioned to the population of the several towns, a number of these cases, containing carefully sterilized swabs, is placed with the Board of Health. On the occurrence of a suspicious case the physician in charge is at once supplied with one of these cases. He applies the swab to the throat of his patient, returns it immediately to the case, and dispatches it without delay by post to the Bacteriological Laboratory of the Board in Philadelphia. The culture is at once made, and within 24 hours the report settling the nature of the disease is received. Several boards have availed themselves of this opportunity, and have expressed great satisfac-

tion at the promptness with which returns have been made, thus immediately setting at rest the vexed question of the diagnosis.

COUNTY ASSOCIATED HEALTH AUTHORITIES.

The experiment of establishing associations of the several boards of health in counties having been successfully tried in Lackawanna County, the State Board, convinced of the value of such organizations, adopted the following resolution:

Resolved:—That it is desirable that the several boards of health in each county should unite in forming an association for the purpose of aiding and stimulating one another in their work, and of promoting public health and uniformity of sanitary administration in their respective counties.

The Secretary was instructed to bring this matter to the notice of the county medical inspectors, and to suggest that in each county in which such an association does not already exist they should take the initiative by communicating with the several boards of health and urging upon them the advantages to be thus obtained.

It was considered desirable also that the several county associations should be in direct affiliation with the Central Association, known as the Associated Health Authorities of Pennsylvania, and send delegates to its annual meetings.

In this connection it may be said that the Central Association at its last meeting adopted a by-law providing that any county association may obtain representation in that body on the payment of $2.50 per annum for each local board connected with it, the board so represented to enjoy active membership in the said association.

COMMUNICABLE DISEASES.

Smallpox has made its appearance at but five points in the State during the year, as compared with eight the year previous and forty-one the year before that. The very general vaccination which took place in 1894, together with the enforcement of the law for the vaccination of school children passed in 1895, must be credited with no small share in causing this immunity. The places visited were:—Finleyville, Washington County; Gilberton, Schuylkill County; Knoxville, Allegheny County; Maltby, Luzerne County; and Priceville, Lackawanna County.

Three of these being small villages without municipal authorities, it became the duty of the Secretary to enforce quarantine, disinfection and vaccination, which was done, with the result of preventing the spread of the disease in each case. In the remaining

two the local authorities acted with equal success under the advice of this Board.

Typhoid Fever.—The assistance of the Board in checking epidemics of this disease has been sought in twenty-one localities, not quite as many as in the year previous. But it must not be supposed that these twenty-one localities were the only places in the State where typhoid fever prevailed. The annual reports of cities and boroughs will indicate many others. The places enumerated are those at which it was necessary for the State Board to interfere, either because they were in rural districts having no health authorities, or because the water supplies were contaminated in districts beyond the municipal jurisdiction.

The city of Philadelphia still maintains its bad pre-eminence as a typhoid centre, the deaths per 100,000 living in the year 1895 having been 40, while in the city of New York for the same year they were 17 and in Brooklyn 16. In a thoughtful paper on this subject by Prof. Henry Leffmann, M. D., formerly chemist to this Board, the dependence of this unfortunate prevalence of the most preventable of all diseases—a disease the presence of which in any community, in the present state of our knowledge on the subject, must be branded as a crime—on the polluted water which the citizens, those of them at least who cannot afford to buy expensive house filters or table waters, are compelled to drink, is demonstrated beyond the possibility of a peradventure. The remarkable experience of Girard College, which your Secretary has called attention to in previous discussions of this subject, is alluded to. In this institution typhoid fever was found by your Secretary, on the occasion of an inspection made in consequence of an outbreak of scarlet-fever, to be almost constantly present. The additional fact was found that the water used by the students was pumped directly from the Fairmount forebay in the Schuylkill River, having no opportunity for sedimentation even. It was strongly urged that a filtering plant be introduced. This was done and the fever at once began to diminish and soon disappeared. In striking contrast with the protection thus afforded to the 2,000 residents of the college is the excessive fever death rate which prevails among the population immediately outside the College walls, who are still using unfiltered, unsedimented water pumped directly from the sewage-laden Schuylkill. As Dr. Leffmann points out, this district is not one in which we ought to expect such mortality, inasmuch as it is well drained, the houses are of good construction and owned

and occupied by people abundantly able to provide themselves with hygienic appliances. The sudden and permanent fall in the immense number of typhoid deaths in the district known as Kensington, coincident with a change in the water supply from the grossly polluted Delaware, from which the people were, as Dr. Leffmann truthfully and not too forcibly puts it, "constantly drinking their own sewage," to the East Park Reservoir, where the Schuylkill water has an opportunity for sedimentation and aeration, before it is supplied to the inhabitants, also affords a demonstration of the clearest character. It has been so thoroughly proven over and over again that the simple expedient of filtration will remove this deadly potency from polluted water, that it is not too much to say that every death occurring in that city from typhoidal poisoning is a murder, which the recording angel will set down opposite the name of some one of those who are responsible for either refusing or failing to provide this preventive measure.

Scarlet Fever.—The prevalence of Scarlet Fever in rural districts, noted in the last report, has steadily increased, the assistance of the State Board having been invited in forty outbreaks, nearly twice as many as the preceding year.

Diphtheria has prevailed to an even greater extent than last year and has been very fatal except where the anti-diphtheric serum has been early resorted to. The number of places which have called upon the Board for advice or assistance has been forty-seven as compared with thirty-six in 1895, an increase of rather more than twenty-five per cent.

In Philadelphia this disease has now been persistently present to an undue extent for a number of years. During the past year there have been 3,351 cases, with 1,020 deaths, as compared with 1,047 deaths the year before.

Cerebro-Spinal-Meningitis has been reported in Philadelphia, Philadelphia County; West Catasauqua, Lehigh County; South Bethlehem, Northampton County; and in Catasauqua County.

Complaints of the Pollution of Streams and other water supplies have been received from twenty localities.

In Hollidaysburg, suit was brought by that borough against the city of Altoona to prevent the latter from emptying its sewage into the river at a point a few miles above the former. The matter is still in litigation. The opinion expressed by your Secretary was that by the introduction of an ample sewage irrigation plant the effluent could be rendered innocuous.

At Kennett Square the water supply was polluted by a large kennel of hunting hounds, to which decomposing carcasses were fed, the enclosure being upon the bank of the stream. The District Attorney was instructed to prosecute the maintainer of the nuisance. The defendant was acquitted on a technicality, but was compelled to pay the costs, and the kennel was removed.

At the request of the Board of Health of Mansfield, Tioga County, your Secretary visited that town in order to determine the character of the water supply. Two very serious sources of pollution were found consisting of the direct drainage into the streams of filth from stables, water-closets, pig-pens and cow-yards.

An interesting investigation into the water supply of Carlisle, Cumberland County, was made by the Assistant Bacteriologist, Dr. R. L. Pitfield, at the request of the Board of Health of that borough. This included on inquiry also into the character of a proposed new source of supply, and affording a convincing demonstration of the importance of requiring all places or companies proposing to introduce water supplies, to submit their plans to the State Board of Health. The proposed source, owned by a company, was extolled as being of absolute purity, as it issued in a large volume directly out of the rocks, and was of sparkling clearness. The inspection, however, demonstrated the fact that the spring issued from the foot of a declivity on which a filthy village was situated and received very serious drainage pollution. The old supply was, therefore retained, with the precaution suggested by the Secretary of introducing a filtration plant.

An investigation made by the same officer into the water supply of one of the State Lunatic Hospitals, in which cases of typhoid fever had been of frequent occurrence, brought to light the fact that the ice used in the institution had been cut from a badly polluted creek. This furnishes additional testimony to the power of the typhoid germ to resist extreme cold.

The prevalence of typhoid fever in Pittsburg during the past summer led the Engineer Inspector of the Northern Division of the Western District to suggest the importance of obtaining definite knowledge as to the probable origin of the disease. Accordingly, at the request of the Secretary, he prepared a list of the towns included in the drainage area of the Allegheny River, and a form of inquiry of the Board of Health or, in the absence of a board, of the burgess of each town.

It is to be hoped that the information when received will be of so

definite a character as to lead to some decisive action for the protection of the water supply of that great centre of population.

It will be seen therefore that the question of legislation for the protection of the purity of water supplies continues to be one of great urgency, and that the Board would be unfaithful to its trust did it fail to urge it upon the attention of the Legislature at each recurring session. The chemical tests in the cases referred to have been made in the Laboratory of Hygiene of the University of Pennsylvania by Dr. D. H. Bergey, Assistant Chemist. Twenty samples have been examined and reported on.

NEW REGULATIONS

have been adopted as follows:

XII. For the Control and Management of Piggeries in the State of Pennsylvania.

1. This Board considers the keeping of pigs an offensive industry.

2. Hog-yards and piggeries will not be permitted within 200 feet of any natural stream or water course, and the drainage from a piggery shall in no case be permitted to reach any natural stream until said drainage has been purified.

3. All pig-pens shall be constructed with water-tight floors, either of plank or cement, which must be elevated at least ten inches above the ground.

4. The feeding of animals dead from natural causes to pigs will not be allowed. Offal should not be fed to pigs for at least a month before they are killed. The animals to be killed should be removed from the pen where offal is fed and should be fattened on grain. Offal from hogs should not be fed to hogs, as disease is liable to be communicated to sound animals in this way. Offal from hogs must be burned or buried.

5. All pig-pens must be daily cleansed and thus kept free from all offensive odors.

6. Where offal from slaughter houses is fed to pigs, the yards should be cleansed at least twice a week, the refuse being buried or burned.

7. Where garbage or offal is fed to pigs, the troughs, basins or boxes should be cleansed and dried as often as is necessary to prevent unwholesome odors from arising.

8. No hog ranch or piggery for garbage or offal feeding, where more than fifty head of swine are kept, shall be established or maintained without a permit from a health authority.

XIII. The dumping of night soil in any river, stream, lake, pond, or other public water in this commonwealth constitutes a nuisance prejudicial to the public health and is hereby forbidden.

The regulation for the control of piggeries has been rendered necessary by the horribly offensive nuisances which have been created by the feeding of garbage to pigs kept for the purpose by thousands, in conditions of indescribable filth, in the neighborhood of large cities. It was formulated by the Chairman of the Committee on Preventable Diseases, after an exhaustive inquiry into similar conditions in other states, and the methods therein adopted for remedying them. The Board has been appealed to from many parts of the State, but from none more frequently than the populous rural districts surrounding Philadelphia. Ever since, in the year 1892, the Board of Health of that city adopted a resolution declaring the keeping of hogs to be a nuisance, and instructed its Health Officer to act accordingly, and more especially since that Board named January 1st, 1893, as the date after which no exceptions would be made to the order just referred to, the State Board has been receiving frequent complaints that garbage hauled from the city was used as food for swine, or as a fertilizer, in such manner as to cause most serious nuisances to the residents of the populous districts immediately outside the city limits. Under instructions from our Board these nuisances have been from time to time temporarily abated only to be renewed after short intervals. The Board, therefore, at a special meeting held February 29th, 1896, adopted the following preambles and resolution which were forwarded to the Philadelphia Board.

Whereas: Frequent complaints have been received by this Board that serious nuisances have been caused and still exist in Montgomery and Delaware Counties, in consequence of the removal of garbage from this city, to be fed to hogs, at points short distances beyond the city limits, and

Whereas: This material contains much that is improper to be fed to hogs which are afterwards to be used as food by human beings, and

Whereas: The above described nuisances exercise an injurious effect on the health of many citizens of Philadelphia as well as the residents of outlying districts, and

Whereas: It has been publicly stated by the City Department which has the control of the disposal of garbage, that ample pro-

vision now exists for the destruction of this material by cremation, incineration or manufacture, therefore,

Resolved: That the Secretary be instructed to address a communication to the Board of Health of the city of Philadelphia, respectfully urging that body to use its influence to prevent the conveyance of any portion of the city garbage outside the city limits for any other purpose than its immediate destruction by fire or convertion into commercial products. This matter culminated in a

Victory for Sanitation on Saturday, October 17th, 1896, when the equity proceedings of the city of Philadelphia, against John C. Lyster, came up for argument in the Court of Common Pleas, No. 4, before Judges Thayer, Arnold and Wilson.

This was an application for an injunction to restrain the defendant from collecting kitchen garbage and offal in any part of the city, from carrying it through the streets of the city, and then disposing of it to hogs, or by spreading it upon lands in the city or adjoining it.

The allegation was that Lyster was collecting garbage and conveying it to a farm in Delaware County, near the County line, where he fed it to hogs; and that he had no contract with the city for the collection of garbage, nor any license or permit from the Board of Health; that this course of conduct was in violation of the ordinance of councils and the regulations of the Board of Health; that it was liable to prejudice the public health by reason of the bad odors which were carried from the farm to the city, and the probable sale of the unwholesome flesh of such fed hogs to the city.

When the case was called it was found that Lyster and others had brought a cross-suit asking for a mandamus to compel the Board of Health of Philadelphia to grant these parties a permit to conduct the business in any way that seemed good to them. The Court held that the Board of Health of Philadelphia was established for the express purpose of deciding questions of this kind, and that should the court grant the mandamus it would be usurping the functions of the Board and itself issuing the license, or that, in other words, the court would be substituting itself for the Board.

The defendant's answer consisted of the admission of fact and denial of matters of law, and after arguments the court granted the injunction asked for by the city.

The effect of this decision will be very far reaching, and will

strengthen the position of every board of health in the State, inasmuch as it makes boards of health final judges as to the fact of the existence of a nuisance and as to whether certain industries are injurious to the public health—in other words, a board of health is a final court of appeal in matters of this nature. The decision was delivered without retiring, through the mouth of the venerable Judge Thayer, and was one of the last rendered by that learned and upright jurist before his elevation to the office of Prothonotary.

In leaving the bench he deserves the thanks of all sanitarians for the invariable support which he has given to those whose duty it is to protect the lives and health of the people against the assaults of greed and avarice.

County Medical Inspectors.—Much good work has been accomplished by the public spirited officers of the Board. Their reports contain much valuable information as to the sanitary condition of the villages of the State,

COMPULSORY VACCINATION OF SCHOOL CHILDREN.

This admirable precaution, adopted in its wisdom by the last Legislature, has been very generally enforced by the school boards, especially in the large cities and towns. Isolated cases of refusal on the part of parents to allow their children to be vaccinated have of course occurred, but they have been less frequent than there was reason to apprehend. The slight amount of hardship thus inflicted on children deprived of the advantages of school education through the ignorance or obstinacy of their parents is a hundredfold counterbalanced by the number of child-lives saved, and the prevention of human suffering and permanent disability. This measure, however, which the State Board of Health has not hesitated to endorse, although it did not originate it, as supposed by many, carries with it a responsibility of the most serious nature. It is charged by the opponents of vaccination that serious results may follow the insertion of vaccine virus into the human system, and they therefore hesitate to allow their darlings to run this risk. The substitution of bovine for humanized virus has deprived this objection of much of its force. There still remains the fact, however, that unles careful precautions are used by the propagators of bovine virus, unnecessary suffering and temporary disability may result in those inoculated with their product. This is the fault of certain individual propagators, who have no higher standard than a commercial one, and who do not exercise proper care in the selection of stock, or

adopt the necessary precautions of surgical, that is to say absolute, cleanliness, in the maintenance of their establishments, the performance of inoculations and the taking of the lymph. This danger being admitted, it is impossible for the health authority of a state which encourages so peremptory a measure as compulsory vaccination to avoid the responsibility which thus devolves upon it to adopt every possible precaution against the use of impure virus within its jurisdiction. Deeply impressed with the truth of this fact our Board has deemed it its duty to institute searching inquiry into the methods adopted for the propagation of vaccine virus by different establishments, not only in this but in other states, whose products were already, or were likely to be, offered for sale to her local health authorities or physicians. For this purpose the committee on Preventable Diseases has undertaken an

Inspection of Vaccine Propagating Establishments and so called Vaccine Farms throughout the United States. This included a personal inspection of each plant by the Assistant Bacteriologist of the Board, Dr. R. L. Pitfield, and a capable veterinarian (in most cases Prof. J. W. Adams, of the University of Pennsylvania Veterinary School), and a bacteriological examination of the points produced at each place. These points were purchased in open market.

The matters investigated were location, size, number and construction of buildings, arrangements for cleanliness, character of animals, mode of operation and of taking of lymph, modes of preparation of virus, precautions taken in packing and bacteriological control. Fourteen of these establishments were visited and the inspectors were uniformly received with courtesy. Of these, four are located in this State. It is somewhat humiliating to find that three of these are not conducted with such regard to hygienic precautions or even to ordinary cleanliness, as to warrant the Board in expressing anything but condemnation of the establisments themselves and of the methods pursued therein. On the other hand it is gratifying to our State pride to be able to point to the fourth as admirable in all its appointments and conducted with the strictest observance of modern surgical asepsis. The establishment referred to is known as the Lancaster County Vaccine Farms, at Marietta, Dr. H. M. Alexander & Co., Proprietors. The favorable report on this institution made by our Committee is confirmed by that of a Committee of the National Conference of State Boards of Health made at Chicago in June last.

INSPECTION OF ANTITOXIC PROPAGATING ESTABLISHMENTS.

At the same time that the vaccine farms were inspected it was deemed desirable that the various antitoxin laboratories in the country should also be visited. These are much fewer in number than the former. Four of them were carefully investigated. It is again a pleasing duty to a Pennsylvanian to be able to note that the report gives an exceedingly high standing to the biological laboratory and stables of the H. K. Mulford Company of Philadelphia, the stables being scrupulously clean, the animals sound and vigorous, the laboratory arrangements good, the technique careful and thorough and the product of somewhat greater strength than advertised. This assertion could not be made of all the imported European products. With these results of a very painstaking scientific investigation before it, is it not desirable that the Board should give its official endorsement to the products of the two establishments just named, as is done in European countries, and in this way encourage other propagators to improve their methods, and thus remove the objections to modes both of prevention and of treatment which are so full of present benefit and of future promise?

COMPULSORY VACCINATION.

SHOULD IT BE ENFORCED BY LAW?

By Clark Bell, Esq., LL.D., President Medico-Legal Congress.

This subject came recently before the Medico-Legal Society, in the City of New York, introduced by a paper presented by Dr. Montague R. Leverson, which mainly consisted of an assault upon vaccination itself.

Most laymen, and the majority of the medical profession, have been educated to accept vaccination as a reliable, safe, and the only preventive of smallpox, and the world has accepted the remedy as discovered by Jenner, whose centennial has just been celebrated by the whole civilized world.

It was not considered quite the proper way to meet the issue by a mere controversy, *pro* and *con*, as to the merits of vaccination, and for this reason the issue was broadened so as to embrace this issue:

"Conceding the utility and efficacy of vaccination as a preventive against smallpox, should it be made compulsory?"

Owing to the agitation in England with regard to compulsory vaccination and the recent adverse report by the Royal Commission, and to the alleged intention to engraft compulsory vaccination into the new charter now being formed for "GREATER NEW YORK," I decided to ask the opinions of some of those known to be most competent to participate in the discussion; and, being quite ignorant myself of how the lymph now in general use is obtained and what supervisions or precautions are observed as to its genuineness and purity, I addressed the following letter to the boards of health in all the neighboring States and cities and to men eminent in the profession, as to the issues and especially as to the subject of compulsory vaccination *per se*:—

Medico-Legal Society, Secretary's Office, No. 39 Broadway,
New York, Nov. 14th, 1896.

My Dear Sir:—I have the honor to enclose a notice of our next meeting and dinner, to be held on the 18th of November, instant, and would be glad to see you present and to take part in the discussion of the 4th question on the programme:—

4. Conceding the utility and efficacy of Vaccination as a preventive against Smallpox, should it be made compulsory?

May I also ask you to advise me in time for use on that occasion if possible, if not, as soon as you can, upon the following additional subjects:

1. What lymph do you use in vaccination and how obtained?
2. Is that lymph obtained by inoculating the calf with the virus of smallpox or from any lymph thus originally obtained?
3. With precisely what lymph is the calf vaccinated and how was that lymph originally obtained for use upon the calf?
4. What supervision is exercised by the Board of Health or any public official over the character, quality and manufacture of the lymph employed in vaccinating the calf as to its efficiency and genuineness.
5. What security have you that the lymph you use or that they employ on the calf is pure?

An early reply will be esteemed a favor. CLARK BELL.

I here add some of the replies received, most of which were submitted to the Medico-Legal Society in that discussion.

Prof. C. A. Lindsley, Secretary of the Connecticut State Board of Health, replied as follows:

Clark Bell, Esq., Editor, Etc.:

My Dear Sir:—I hasten to return to you the very remarkable essay of Dr. Leverson. I am amazed at the bold effrontery of a man who would dare to make such an illogical and mendacious harangue before a body of intelligent men. It surely can have but little influence upon the members of the Medico-Legal Society. If it were

to be published in the religious press or in village papers, where it would meet the uninformed and ignorant reader, it might do some harm, but surely it is not worth any one's time to answer such stuff in the pages of the Medico-Legal Journal.

I return you the paper at once, so that if you have any mind to submit it to someone else to respond to, there may be less delay.

For my own part I have been hindered so much by other duties, that I am far in arrears in the preparation of my annual report of the State Board of Health. My college work is on also at present and I cannot for some weeks to come spare the time the importance of the subject demands to make a suitable reply.

Very respectfully,

C. S. LINDSLEY.

George B. Fowler, M. D., Health Commissioner of New York City, replied to the question as follows in a letter to the Secretary:

Clark Bell, Esq., 39 Broadway, New York City:

My Dear Sir:—Your communication of the 30th, relative to my replying to a prospective paper before the Medico-Legal Society, by Dr. M. R. Leverson, in which he assails "compulsory vaccination," is at hand. This Board is not in favor of "compulsory vaccination," and never has been. It is acting under the State laws when it assists the Board of Education in securing the vaccination of pupils and teachers. So thoroughly has this co-operation been carried out that in the last ten years, during which three epidemics of smallpox have occurred in this city, not a single pupil or teacher connected with the public schools has been reported to this Department as suffering with smallpox. The reason the Board of Health does not believe in compulsory vaccination is because it is believed that such a statute would result in antagonism to the work, which would defeat the object it has always secured in the way of gratuitous and voluntary vaccination, and the comparative immunity from smallpox for which this city is noted.

I therefore do not see any reason why I should defend the position that Dr. Leverson proposes to take in this paper.

Yours very truly,

GEO. B. FOWLER, Commissioner.

Dr. Moreau Morris, M. D., Health Department, New York City, replied as follows:

Clark Bell, Esq., Secretary of the Medico-Legal Society:

Dear Sir:—To the question, "Compulsory Vaccination, should it be enforced by the law?" I would respectfully answer, that for a general State law, negatively, but for local purposes in cities or villages having a population of 1000 or over, where large congregations of school children especially congregate, there should be compulsory vaccination as a precedent to school admission.

The experience of other countries and in this city in suppressing the spread of smallpox, by carefully selected vaccine virus introduced into the human system by proper antiseptic means, seems to set the seal of its legitimacy for public policy and universal protection beyond all question. The public protection is paramount to any and all private interests. Respectfully yours,

MOREAU MORRIS, M. D., 109 East 73rd Street, N. Y.

Prof. Eugene Foster, Dean of the Faculty of the College of Georgia, replied as follows:

Mr. Clark Bell, N. Y. Medico-Legal Society, No. 39 Broadway, N.Y.

My Dear Sir:—Pray pardon my failure to earlier make reply to your letters of Sept. 28th and Oct. 1st, great press of business together with several absences from the city has prevented earlier attention to the matter. I very sincerely appreciate the compliment extended in asking me to submit a paper on Vaccination to be read on the 3rd Wednesday of November in reply to one to be presented by Dr. Montague R. Leverson. I could not do justice to the subject of Vaccination in a "short paper." I have written exhaustively upon this subject in my article on "The Statistic Evidences of the Value of Vaccination" which was presented at the Jenner Centennial at the recent meeting of the American Medical Association in Atlanta. This paper you will find in a series of articles which were published in the Journal of the American Medical Association. If this paper does not produce sufficient evidence to satisfy a reasoning man as to the safety and efficiency of vaccination I could not consent to waste time in arguing the question with him. In my positions on the question of vaccination, I am sustained by almost every reputable medical man in the civilized world. I do not attempt to argue the good policy of compulsory vaccination; this is a question entirely separate and distinct from its efficiency and safety, and many of the best members of the medical profession seriously doubt if indeed they are not actually opposed to compulsory vaccination. I have had the article above referred to reprinted, and will in a short time send you a copy of it if you desire me to do so.

I very greatly regret that I did not know that the copy of the Berlin Report of the Consul General referred to by you was not preserved by me, that is, the original received from Surgeon General Sternberg, was included among the manuscript turned over to the printer with the balance of my article read at the Jenner Centennial.

I will be very glad to have you send me Dr. Leverson's article as promised in yours of October 1st, for the reason that I do not now receive the transactions of the Medico-Legal Society as I formerly did. I am Very truly yours,

EUGENE FOSTER.

Col. W. P. Prentice, counsel for the health authority, replied as follows:

Clark Bell, Esq.:

Dear Sir:—I have the honor to acknowledge your letter of the 2nd inst., with its invitation "to prepare," for the meeting of the Medico-Legal Society on November 18th, my "views" upon the following theme, "Conceding the utility and value of vaccination as a preventative, should it be made compulsory by law?"

There cannot now be said to be any open question subject to concession in the first clause of your theme, in my opinion; but as the Register of Scotland reported in 1874, "there is but little of that unreasonable opposition to the practice of vaccination" remaining, and the recent report of the Parliamentary Commission of England, of which Lord Herschell was the chairman, following similar reports in Germany and other States, closes the discussion for the present, exhibiting the impracticability of opposition. This result adds strength to the argument for the indirect methods of securing vaccination. I have elsewhere in my book on "Police Powers" discussed this question more at large, and have given reference to many cases, including those which have maintained a personal liberty where the public health was not directly endangered. At page 132 this statement was made, "Compulsory vaccination has been instituted in several countries, and by the laws in several States in respect to minors. City ordinances regulate it, but the indirect method of excluding children not vaccinated from schools and factories, or in case of immigrants, insisting upon quarantine, and the offer of free vaccination, with the constant supervision of the health officers, are more effective."

This opinion I still maintain, and in common with many others, have not ceased to regret the unwise proceedings which have been occasionally undertaken in defense of health and sanitary laws, weakening their proper force. The Court of Appeals' decision in 1895, Matter of Smith (146 N. Y., 68), brings up the sound rule to govern such cases, viz.: that, "where a right to restrain the citizen in his personal liberty, or to interfere with his pursuit of a lawful avocation, is claimed to sustain the claim, it must appear very clearly, not only that the right has been conferred by law, but that the facts existing justify its exercise. The validity of the law is not so much called into question as the right to enforce its provisions," the opinion says, and again uses words which I would adopt. "I think no one will dispute the right of the Legislature to enact such measures as will protect all persons from the impending calamity of a pestilence, and to vest in local authorities such comprehensive powers as will enable them to act competently and effectively." Little can be added to the lesson of this judgment, and I believe we have at present sufficient laws, if they are duly administered and properly enforced.

I remain with great respect,

Yours truly,

W. P. PRENTICE.

Sir Frederick Bateman, of Norwich, England writes:

Upper and Giles Street, Norwich, Nov. 4, 1896.

Clark Bell, Esq.:

My Dear Sir:—You ask my views on compulsory vaccination. It so happens that this question has much engaged my attention, and I send you a pamphlet in which at page 5 you will see my mature views on this subject. With kind regards,

Yours faithfully,

FREDERICK BATEMAN.

The pamphlet referred to is the annual report of the Asylum Union for 1895, by Sir Frederick Bateman, which cannot, for want of space, be given, but the summary will be of great interest, which is as follows:

I hold that any individual who from his obstinacy declines to avail himself of the protective influence of vaccination, and thus risks not only his own life, but that of his innocent neighbor, is just as much liable, or ought to be, to punishment by law as he who knocks his neighbor down, or picks his pocket; and I maintain it is a wicked crime for persons in the broad daylight of the nineteenth century, from obstinacy or ignorance, to abstain from being vaccinated and from having their families similarly protected.

As hypothesis and mere opinion have but little influence, I wish to support these remarks by some documentary evidence in reference to the results of vaccination. During a period of 16 years, 5,797 cases of smallpox were admitted into the Smallpox Hospital, at Highgate. Of this number, 2,654 or nearly one-half were unprotected by vaccination; of these, 996 died, being 35½ per cent. Now just mark the reverse; of those properly vaccinated—and I lay great stress on the word "properly," because otherwise these statistics might be pulled to pieces—just under one per cent. died; so here you have 35½ per cent. dying, of the unvaccinated, and less than one per cent. of the vaccinated.

The latest scientific views as to the value of vaccination may thus be summarised.

1st. Vaccination properly performed in infancy, affords an almost complete protection against smallpox up to the period of puberty; but it is important to bear in mind that vaccination is a surgical operation, and should be performed in a satisfactory and careful manner; for many of the supposed failures are in reality due to the careless way in which the operation has been undertaken.

2nd. That in the few instances in which vaccination may fail to impart absolute protection against the smallpox, it nevertheless, in the majority of instances, modifies the course of the disease, and renders it less fatal, as was strikingly exemplified in the outbreak at Hackford.

3rd. That at puberty, re-vaccination is strongly to be recom-

mended, and that, as a rule, such re-vaccinated persons may be regarded as permanently protected, although in an epidemic of smallpox, it may be a wise precautionary measure to submit them again to the process of vaccination.

The importance of the subject, and the fact of the recent outbreak of smallpox in this Union, must be my excuse for dwelling at such length on the efficacy of vaccination. The arguments for the necessity of it have been much strengthened by the remarkable discoveries recently made in connection with bacteriology and the antitoxin treatment of disease, discoveries which have been hailed with acclamation in all parts of the civilized world; and I unhesitatingly and emphatically assert that Sanitary Authorities will be neglecting their duty, in the face of all this, if they do not resolutely and unflinchingly put into operation the compulsory clauses of the Vaccination Acts.

C. S. Lindsley, M. D., Secretary of the State Board of Health of Connecticut, replied as follows:

Clark Bell, Esq.:

Dear Sir:—In your courteous invitation to me, on September 1st., to prepare a paper "In support of Vaccination," there is not a word about "compulsory." In your favor of September 10th, you speak of my proposed paper, "defending compulsory vaccination." Defending vaccination and defending compulsory vaccination are two quite different things. I am not an advocate of compulsory vaccination. I am positively opposed to it. But wholly on the ground of expediency. The people of this country are too thoroughly imbued with a sense of personal independence to submit patiently to personal compulsion. The attempt would excite hostility to vaccination that does not exist at present, and would hinder rather than promote the cause of vaccination.

I have received this morning another notice with an invitation, which I regret to say I shall not be able to accept by reason of other engagements.

Lack of time obliges me to reply briefly to your numerous questions although they cover enough for a small volume. I will answer them as you have numbered them.

Q.(1). Ans. Sometimes humanized and sometimes bovine virus.

Q. (2). Ans. No.

Q. (3). Ans. From a previously vaccinated calf, and originally from a cow or heifer with vaccine disease.

Q. (4). Ans. In most states there is no legalized supervision.

Q. (5). Ans. My only security is the known care and precaution which are observed by the best producers; except when I use humanized lymph, and then my own personal knowledge of the health of the subject from which it is taken.

Very respectfully,

C. S. Lindsley.

Dr. Saml. W. Abbott, Secy. Mass. State Board of Health, replies: Clark Bell, Esq., 39 Broadway, New York, N. Y.

Dear Sir:—In reply to your kind invitation to be present next Wednesday, I should like very much to be there but it is impossible.

In reply to your questions:

(1.) I invariably use vaccine lymph from the calf. There is no objection, however, to the use of human lymph provided you know that it comes from a healthy source.

(2.) The original source of the disease in the cow is undoubtedly some exposure to smallpox infection. Experiment has definitely settled this point. The term "spontaneous cowpox" has often been used in this country and abroad in connection with this subject. No progressive physician, however, at the present day, would for a moment admit the use of such a term. Infectious diseases have an origin, and that origin is an infectious disease of the same kind. As a matter of fact the term is simply used as a catch-penny dodge for lining the pockets of some particular producer of vaccine lymph. I have seen and examined very many cases of cow-pox in the cow occurring in large dairies, but these invariably occurred during progress of epidemics of small-pox, such as those of 1880, 1872 and previous years.

(3.) Calves are vaccinated either with lymph from other calves or with lymph from healthy children. The latter method is quite as efficient as the former, and is recommended by the very highest authorities in Germany where this whole subject has been treated in the most scientific manner.

(4.) Very little supervision is exercised in this country over the production of vaccine lymph. The State Board of Health of Minnesota maintains a small plant and produces lymph of a reliable quality. In my opinion all vaccine production should be under the supervision either of State or National authorities.

(5.) The only security now given is the guarantee of the producer.

Finally, the principal fault in vaccine production in this country is due to the fact that the whole question has been treated commercially instead of scientifically. It is, however, pleasing to know that the movement is tending in the right direction.

Recent inspection of vaccine establishments has undoubtedly effected considerable reform, but there is abundant room for more. Too much reliance should not be placed upon bacteriological examination of vaccine products made upon a few specimens. No good sanitarian is willing to pronounce upon the quality of a sample of water from the chemical analysis alone, but finds it necessary to have a thorough knowledge of all the surrounding circumstances The same is true in regard to vaccine production. A well-managed establishment under careful supervision, and conducted upon the best principles, may be depended upon to furnish a good product.

The best argument for compulsory vaccination is the present

condition of Germany, which has been practically free from smallpox for the past 20 years, in consequence of thorough enforcement of the law. Most of the deaths in Germany, from smallpox, in three years have been those of recent unvaccinated immigrants from Russia, France or Italy.

The Imperial Board of Health of Germany has just issued a publication, entitled "Smallpox and Vaccination," which presents very fully the history of the subject, together with much that is valuable with reference to present conditions in that country. Many figures are presented which do not reflect creditably upon the condition of the neighboring countries, and show that the prevalence of smallpox in these communities is inversely as the thorough manner in which vaccination and re-vaccination are conducted.

It appears from this document that in the five years (1889-1893) the death-rate from smallpox in the German Empire was only 2.3 in each million inhabitants, while in the neighboring countries it was as follows:

In France .....147.6 per million.
In Belgium .....252.9 "
In Austria .....313.3 "
In Russia .....836.4 "

Or, in other words, had the same rates of mortality from smallpox prevailed in Germany as existed in each of these four countries, there would have been a loss by death from smallpox, respectively, of 7,321, 12,584, 15,558 or 41,584, according to the country with which the comparison is made. These figures speak for themselves. It is no wonder that the compiler in closing the volume pays a glowing tribute to the memory of Jenner, and expresses the hope that "the number of those who look back upon this day (May 14, 1796) with thankful hearts may continually increase."

Yours respectfully,
SAMUEL W. ABBOTT.

Benj. F. Lee, M. D., Secretary State Board of Health of Penna., replies:

Mr. Clark Bell, Secretary Medico-Legal Society,
No. 39 Broadway, N. Y.

Dear Sir:—The matter of which you request information from me to be used in the discussion at the meeting November 18th, is of so much interest and importance that I take the liberty of replying to your communication. As a portion of my answer, I send you a copy of "Public Health" for July last, and refer you especially to page 145, on which, and the six pages following, you will find a very full statement of the methods pursued at the Lancaster Vaccine Farm, the product of which I use exclusively and do not hesitate to recommend.

With regard to questions 4 and 5, I would say that the State Board of Health makes frequent inspections of this establishment

at unexpected times, and that both the precautions taken and the result of the bacteriological tests, as well as the clinical evidence, convinced me that pure lymph is used in propagation and is dispensed from this establishment. I have the honor to be,

Yours very truly,

BENJ. LEE.

The extract to which Dr. Lee refers is from the report made June 15, 1895, by Robert L. Pittsfield, M. D., Assistant Bacteriologicalist Pa. State Board of Health, to the committee on preventable diseases of that Board, published in the new journal called Public Health, vol. 1, No. 3, p. 145, and relates to the Lancaster County Vaccine Farms, of Marietta, Pa. A description of the methods employed in the vaccination of the calf is given in detail, as follows:

11. Vaccination of animals.

a. Description of method.—The animal is strapped to the V piece with girths, and then is swung over on back. The spinal column does not rest on the table, a space in the cushion accommodating it.

b. Point of selection for vaccination.—The point selected is the scutcheon over the biceps muscle and sometimes anterior to the udder and on the back, but it is considered best by Dr. Alexander to use the scutcheon.

c. Area of scarification.—The area of scarification is about the size of a half dollar, and six to eight are made on each leg.

d. How scarified.—The animal is carefully washed with bichloride solution, twice shaved and washed, dried with a clean towel, and then scarified with knife previously sterilized. The lymph from the spades is carefully rubbed in.

e. What preparation given the hands. Clothing of operator.—Operator washes his hands in bichloride, and is dressed in a clean suit of white duck, and every precaution is taken by the operator to keep his person clean.

f. Character of seed used.—The seed used is preserved on spade points in a refrigerator, where all other vaccine matter is preserved.

12. Maturity of vesicle and the time of removal.

a. Temperature at highest.—102½ degrees to 104 degrees F., taken twice daily.

b. Removal of lymph. The operator is guided by the areola about the vesicle as to the proper time to remove the lymph, also by the temperature. The proper time for removing the lymph is from 5 7 days, depending upon circumstances. The crust is hard to keep in place and is convex rather than concave as in the human subject.

13. Food and water.

a. Regarded by operator.—These play a very important part in the development of the disease. If the least musty food or unpalatable water be given, the animal may refuse to eat or drink for from twelve to twenty-four hours. This will frequently result in an abortive condition of the vesicle. Plenty of good, fresh water is absolutely necessary if you desire a lymph that will give the greatest perfection of development and the least inflammatory action.

b. Character of food used.—Corn chop and bran (half of each by weight), mixed with cut hay in a concrete mixing box, which can be kept clean and will not sour readily, have given them the best results, next to forage crops, of which they use cow-peas and oats, green wheat and rye, clover, Hungarian millet, and fodder corn. Food from a silo they are unable to use, as it requires from two to three weeks to get the animal accustomed to it, and changing them every thirty days renders it to them an impossible food.

c. Water supply.—Water works, having three large reservoirs arched over in the hill-side and supplied with water from two sources; one from the roof water and the other forced by a wind pump from a well 77 feet deep; this water is river water, filtered through a sandy loam. All the water from these reservoirs, used for watering stock, operating uses and cleaning purposes, is first filtered through bricks, then through Pasteur plates arranged in reservoirs. These reservoirs are located sufficiently high to enable the tapping of water throughout the establishment. They are also connected with the town supply. The cattle are watered by turning water into their troughs, which are lined with galvanized iron. This insures them a much more ample supply than the use of buckets in the hands of employees.

14. Preparation of vesicle.—This is done on the 7th day generally.

a. Cleansed.—The parts around the vesicle are cleansed with a solution of bichloride and are then washed with water.

b. Removal of crust.—This is accomplished with great care by means of a knife, and the parts under this are sponged with sterile water and sponge until all the pus has been washed away.

c. Care taken with vesicle.—The vesicle is carefully cleansed and the lymph, as it exudes, is gathered from the base of the vesicle by means of sterile brushes and applied to the points. The points are not touched by the operator with his hands or person at any time.

d. Application of lymph to points or tubes.—The lymph, by means of brushes, is painted on the points held in wooden clamps holding 50 each.

e. Collection and preservation of seed.—This is collected upon spade points and preserved in refrigerator.

f. Fluid lymph.—Is collected from the cleansed vesicle and mixed in 30 per cent. to 50 per cent. glycerine. It is collected by a scapel from the vesicle and flows from it into a receptacle previously sterilized. It is then run into capillary tubes.

15. Care of points and tubes.

a. Preparation of naked points.—These are soaked in alcohol and placed on a screen and then a lighted match ignites all the alcohol. They are then placed in a hot air sterilizer for an hour at 150 degrees C. This double procedure is unnecessary.

b. Sterilization of points and tubes.—This is accomplished in a hot air sterilizer.

c. Packing of points.—After the points are inoculated they are dropped from the frames into clean jars, and from these they are packed into glass bottles. There is a minimum amount of handling with the fingers in this operation.

d. Crusts.—Crusts are sold but not advertised.

e. Lymph tubes.—Tubes sufficient for one vaccination are filled by capillary attraction. Other tubes containing enough for 10, 20 or 50 vaccinations are filled and corked at one end, the other end is drawn to a point, the lymph is caused to exude by pressing in the cork.

16. Bacteriological control.—No bacteriological control is given, but bacteriological principles bearing upon aseptic sterilization are carefully followed out. Great care is evinced in this direction and much effort has been spent to render the product as clean and aseptic as possible.

Bacteriological examination of vaccine products.—In common with those of other places, those of Lancaster County Farms were purchased in open market and submitted to the same method of analysis previously described.

Number of bacteria on vaccine points and in fluid lymph.—

Product	Gelatine	Apgar at 37 degrees
One point	175	...
One point	...	175
One drop fluid lymph	...	...

Summary.—This is an admirable establishment in every particular No objections could be found in so far as hygenic arrangements go; the farm is thoroughly drained and the interior of the buildings scrupulously clean. The animals seemed well fed and of excellent breeds. The habitual and thorough testing with tuberculin in every animal, in conjunction with the physical examination, is a step in the right direction. It seems a needless precaution to filter water, and to burn off the points before sterilizing them. The excellent bacteriological showing of the product, purchased with the others in a large drug store, is an index to the hygenic condition of the cattle and the pains taken in removing the lymph to keep it aseptic.

The report of Dr. Pittsfield from which I make some extracts of matters germane to this discussion, in addition to that part of it cited by Dr. Lee, is of great interest. I quote from Dr. Pittfield's report to the Pa. State Board:

"There are a number of problems to be discussed in dwelling on

the propagation of vaccine lymph. These concern the elimination of the diseased cattle from the healthy; the sterilization of the points, hands, instruments, etc.; the care of the vesicle; the preparation of the skin; and the aseptic removal of the lymph.

"At but two of the stations visited was tuberculin used; in two the animal was killed and examined before the lymph was sold. The possibility of infecting points with anthrax bacilli exists, since in many localities cattle are often affected with this disease. At no establishment could we learn of any precautions against such a possibility. In many establishments malignant oedema and tetanus bacilli might find their way to the vesicle and thence to the points and tubes, because dust in large quantities abounds in the incubating stables. This is especially true in those farms where the hayloft is directly above the stables, as dust from hay and manure is well known to contain these germs, and such dust could easily filter down directly upon the vescicles. Cases of gangrene and tetanus following vaccinations have been reported.

"In many places simple cleanliness is sadly neglected; in others, however, the principles of asepsis and antisepsis are rigidly observed, and lymph from such establishments should be used in preference. Sterilization of the hands, instruments and apparel is a great advance in the right direction, as is a similar treatment of the points and tubes.

"The sale of crusts, because of the pus and dust contained in them, should be forbidden by law. Some operators not only render the fresh skin aseptic by scrubbing and antiseptics, but also carefully clean the base of the vesicle, after the removal of the crust, with antiseptics. If this does not interfere with the taking qualities of the lymph, it is an excellent procedure. In some places we found that the pus layer, for such it is, was not regarded by the operators as pus. In fact, some regard it as a particularly strong lymph and charge their points with it. Such points should not be used. Microscopical examination of this substance reveals pus organisms in large quantities, also typical pus cells.

"Points should be placed in frames and carefully sterilized, and after this they should not be handled at all. The application of the lymph to the points by means of a sterile brush is an excellent procedure. It is not only economical, in so far as time and saving of lymph go, but it is also scientific. The individual application of the point to the vesicle irritates it. The point is likely to be contaminated by the fingers, and the drying of these points on dusty, unsterile plates is antiquated and unscientific."

Regarding the propriety of compulsory legislation, conceding the utility and efficacy of vaccination, and that the virus is properly prepared and the vaccination carefully conducted.

Upon the law of the matter I am disposed to concur with the views of Col. Prentice.

In case of a threatened epidemic where the safety of the lives of others and general immunity from the spread of the disease was the

question, the State it may be claimed would have a right to interfere against the private and individual right as in the case of a conflagration, in tearing down a building in its path to save others beyond it.

It seems to me that enough has already been disclosed in this discussion to make the State hesitate in assuming the extraordinary power of compulsion over an individual protest.

There are well authenticated cases of terrible results, of health permanently ruined and life rendered not alone valueless but horrible by vaccination.

If it should be claimed by the sufferer that the physician who operated (or the State if compulsory) was liable in damages for the injury it would be impossible to meet or deny the justice of such a claim.

It seems to be true that there is no State or official supervision over the manufacture or sale of the vaccine matter now in universal use, and this, where vaccination is compulsory, is inexcusable neglect. The manufacture is at present a purely commercial and business matter, and it is very doubtful whether the courts would sustain the enforced vaccination of a citizen against his will, without the State itself assumed the responsibility, not alone of the purity of the virus, but of the outcome of the administration.

Those American officials who are in a situation to be best informed upon this subject, like Dr. Fowler, C. S. Lindsley, Moreau Morris, and others, are unwilling to favor making vaccination compulsory. Even while conceding and asserting the power of the State they doubt the wisdom and propriety of such a law, and on a view of the whole ground, I incline to that view.

The state of the public mind is such, and so great is the doubt and distrust of so large a portion of the educated classes (not the ignorant or prejudiced alone), that it would be very unwise to attempt to legislate compulsory vaccination without the State at the same time charged itself with responsibility in all cases, as well with the purity of the virus used as against any unfavorable result to the vaccinated.

It is worth our while to consider whether in the face of the report of the Royal Commission, adverse to compulsory vaccination, we should hesitate before we decide, in the absence of any epidemic especially, to enforce by statute such an encroachment upon the personal rights of a citizen, as compulsory vaccination with its risks (against and over his protest), which comes from the enforcement of a compulsory statute. Again, when we consider the views of such observers as Dr. Samuel W. Abbott, Dr. Benj. Lee, and particularly the careful report of Dr. Robert L. Pittsfield to the Board of Health of Pa., in which he reports a careful and critical examination of a large number of the establishments engaged in the manufacture of vaccine virus, showing that

in the major part great carelessness and negligence exists as to the purity of the product, and that no official supervision exists anywhere over this manufacture; should we not consider, in view of the imminent risk to the citizen from the use of carefully collected virus, that some legislation should protect the citizen (if the enforcement of compulsory vaccination shall be legalized) from the serious consequences following the use of impure virus.

THE CAUSATION OF DIPHTHERIA.*

By Dr. W. Leslie Mackenzie, Medical Officer of Health, Leith.

Not long ago—it was in May of this year (1896)—circumstances found me in London.

"Have you been to The Poplars?" inquired a medical friend.

"No," I answered. "Where is The Poplars?"

"The Poplars," he said, "is the name of the farm at Sudbury in Middlesex where the anti-diphtheritic serum is prepared. Dr. Blank, from India, and I intend to drive out there to-morrow. Will you come?"

"I should with pleasure," I said, "but I fear my duties will prevent me."

And they did.

But on another day I took the train at Euston Station. Sudbury lies in Middlesex, to the north-west of London. From Euston it is only some eight miles by rail. The train sweeps you rapidly out of the new-laid north of London into a purely agricultural landscape. You pass Willesden, Harrow-on-the-Hill, and Wembley, until you come to a little country station that seems as far from London as the Glenkens of Galloway.

When I arrived at Sudbury I asked my way to The Poplars. The Poplars? The first person was not certain; he bade me inquire of a carrier, whose horse stood at a public-house door. Of him, then, I inquired: but his knowledge was vague. "I think, sir, it is about a mile farther on, to the left hand side." I walked onwards, over a dusty road, among rows of tall trees, and I was saluted everywhere with the charming and inimitable greenery of southern English landscapes. At last, guided by the map as much as by personal inquiry, I came to a farm—a dairy farm. "No, sir; The

* Paper read at the Congress of the Sanitary Association of Scotland, held in Dumfries, September, 1896.

Poplars is farther on." Every one that answered spoke of The Poplars in the most common tone of voice, as if one dairy farm were like another, and one green field not more than another green field. They showed no sign that within stonethrow of their door a miracle was going forward. The resources of science and the resources of nature were here coming to deadly grips, and the victory was less likely to be with nature than with science. Here the intellect of an inventive century was busy among the waft and the woof of life's evolving web, if haply one patch or pattern might yield up its secret. The tall trees near me, the green grass farther away; the farm-yard living things here, the silent farmer there; the silent, still life made more silent and more still by the oppressive contrast with the tangled noises of London,—all came together in my imagination as I approached this farm of mystery, where the Faust of our era, Science, was busy with his alembics and his books of magic and wealth of learning that should save man from his sorrow. And I was reminded of the Spirit's reply to Faust when he was beginning to handle the instruments of mystery:

> In the currents of Life, in action's storm
> I wander and I wave;
> Everywhere I be,
> Birth and the grave.
> An infinite sea,
> A web ever growing,
> A life ever flowing:
> Thus I weave at the loom of the years
> The garment of life that the Godhead wears.

At last I came on some roadside houses which the Time Spirit seemed to treat kindly. *There* was The Poplars. I rang and was admitted. In the room I recognised books and photographs and interests that belonged to my friend when we were at college together; and when the first doctor appeared I found him the same clear eyed scientific idealist that I have known and admired for so many years a gentleman who came from South Carolina to learn the science of medicine at Aberdeen, and who now, after years of practical study, was still filling his mind with more mysteries of bacteriology. The doctor-in-chief—the director of this farm—came in about half an hour afterwards. He also is an Aberdeen graduate, and a contempory of my own. It did not lessen the feeling of romance that two of the same University should have come—one from the North of Scotland, the other from the Southern States—to work out together and help to make the life-saving fluids that

have raised our hopes so high. And more than ever I felt that here is your true man of practice: he labors night and day in the light of the pure intellect, adding fact to theory and developing theory from fact; heeding neither day nor night, neither wealth nor poverty, neither comfort nor pain; caring only for the truth and the good it may do. So long as life can offer us those free minds ready to give themselves up to truth and the service of man, the pessimist may utter his worst but the world is going forward.

The afternoon was a lucky one. A wire had been received the night before from Egypt for a supply of serum. Immediately on receipt of the wire the horse was bled and the blood subjected to all the operations necessary to separate off the serum and maintain it pure. These operations are very simple and they apply to all the serums prepared—to the anti-diphtheretic serum among the rest. The horse is bled from the neck in the way familiar to most men. The blood is received into a large flask, perfectly sterilised. In this flask it is allowed to sit until the clot separates from the serum. The serum is then decanted off and filtered through a Chamberland-Pasteur or Berkefeld filter, under pressure of a small air-pump. This process is very slow; the serum is more or less viscid, and, unlike water, it filters very slowly through the minute pores of the *Kieselguhr* or porcelain. At every stage every precaution is taken against contamination, and the purpose of the filtration is to free the serum of any chance micro-organisms caught in the passage from the horse to the flask. The next stage is the bottling, and it was my privilege to see the bottling of the first anti-choleraic serum ever drawn from a horse in Britain, possibly in the world. The process is very rapid and very precise. The two doctors and the Laboratory Boy take up their places at a bench, the American on the left, the Director in the middle, the Laboratory Boy on the right. Ready to the hand of the American is a heap of small phials, perfectly sterilised and plugged with cotton-wool. in front of him is the flask of filtered serum. The flask has a hooded pipette. Attached to this flask is a blow-pipe bellows which he works by foot, so forcing the serum through the pipette. To his right is a bunsen burner. In front of the Director lies a vessel with indiarubber corks, also sterilised. In front of the Laboratory Boy is a vessel of melted paraffin, kept at boiling point. At a signal from the Director the work begins. The American snatches a phial; with a forceps, which he passes through the bunsen flame, he removes over the flame the plug of cotton-wool, instantly places

the mouth under the boiled pipette, forces into it the proper amount of serum, and hands it to the Director. He in turn has already taken up a sterilised cork with a sterilised forceps: instantly he dips the cork into the phial over the flame, and hands the corked phial to the laboratory boy. He in his turn dips the corked end into the boiling paraffin and sets the phial down. These operations are carried out so rapidly that some 600 phials may be filled in an hour. After the filling the phials are kept in an incubator for twenty-four hours, and, if possible, longer. If at the end of that time any one of a set shows the slightest sign of impurity or microbic life, the whole set is destroyed. Such is the care taken in the preparation of these delicate antidotes to those delicate and remorseless poisons. What the result of this day's bottling may be we shall doubtless hear in due season.

Afterwards I was taken round the farm, which has twenty-two horses, many rabbits, and guinea-pigs by the score. Among the horses the Director pointed out the first pony that had ever yielded anti-diphtheretic serum in Britain. He had now ceased to yield any; but he was kept as an interesting old friend, and he was quietly enjoying the life he had so well earned by his blood. The other interesting phenomena of this marvellous factory of animal fluids it would lead me too far from my purpose to describe.

What I have described, however, is intended to bring out a sharp contrast. At this farm we find that diphtheria has a perfectly definite meaning; it yields its poison; it produces its definite sequences of morbid phenomena; it produces its antidote. At every stage it is under control; its actions and reactions can be predicted; its precise strength can be measured; it can be neutralized to a perfect nicety. I was shown about a pint and a half of diphtheria fluid which, so I was informed, was the most concentrated and strongest diphtheria poison hitherto produced in the world. Yet it was in use there to produce definite, predictable results. This is on the one hand: a definite set of logical relations, a definite theory of causation, a definite verification in practice.

What is there on the other hand? There are masses of speculations and observations and statistics; cases and epidemics and deaths; contention and argument and counter-argument. There are disputes on the part that is due to air, to climate, to season, to situation, to soil, to subsoil, to water, to soil-water, to dampness of houses, to absence of light, to filth, to accumulations of refuge, to decaying vegetables, to unsanitary drains, to articles

of food, to the lower animals, to personal disposition, to personal habit, to personal contagion, to the aggregation of children in schools, and to many other more individualized and detailed circumstances and conditions. Here, therefore, there is room for much scientific labor; innumerable disputes are impossible; but it ought to be the endeavor of the men of practice to bring to these vast masses of unorganized observation the same definite and persistent methods as characterize the men of science, who are, after all, the most highly developed men of practice.

In a paper read before this Association last year I gave a brief and general outline of diphtheria as it is at present known to science. This year I have been requested to open a discussion on the causation of diphtheria. Logically, cause is the particular combination of conditions that precedes any occurence of the disease. When diphtheria is pure, as in the laboratory, it is a name for the life-history of the Klebs-Loffler bacillus growing in a certain media—whether the medium be an albuminous fluid in a test-tube or the varied tissues of an animal. For a pure case of the disease, therefore, the question of causation may be regarded as no longer open. When, however, diphtheria is impure or mixed, as it almost invariably is in the actual human being, the question of cause is no longer so simple. It then becomes necessary to determine—not whether the bacillus working in a particular medium will cause the disease, but—why the disease has occurred in a particular place at a particular time. And this is a vastly more complex question. The media for the growth of the bacillus are no longer limited to the known compositions of the bacteriological laboratory; they are various as the conditions of life in a complex civilization. Here, therefore, it is possible to indicate only a few of the conditions that may become the cause of an actual case at a particular time in a particular place. As far as possible I shall try to indicate those conditions through an actual instance. Doubtless the experience of most at this Congress will furnish other instances equally relevant.

1. *Climate.*—By climate I mean the prevailing weather of a locality. In the 1892 report by the State Board of Health for Michigan (p. 161), six outbreaks are assigned by the medical officers to certain meteorological conditions. One was due to "changeable weather," another to "inclement weather," a third to "exposure to cold," a fourth to "catching cold from home to school," a fifth to "exposure to wet." In these cases the weather

is not to be understood as the specific agent: rather it is one of the prominent conditions that make a given outbreak possible. Raw weather means raw throats, and raw throats are so many traps for the diphtheria bacillus.

2. *Soil and Soil-water.*—Dr. Monckton Copeman, in the Journal of the Sanitary Institute, April, 1896, summarises the researches of Dr. Thursfield and of Dr. Adams. Soil as a cause of diphtheria outbreaks may operate in three ways: first, by its natural dampness, which may be due to high subsoil water or a prevailing clayey condition; second, by being polluted with decaying refuse, animal or vegetable; third, by leading to dampness in dwelling-houses. (*a*) "Mr. Adams," says Dr. Copeman, "claims that his records show during the whole period over which they extend a strict concordance between soil-dampness and diphtheria on the one hand, and absence of diphtheria and soil-dryness on the other hand the disease reaching its acme of virulence when stagnation of the subsoil water is most complete. He contends, moreover, that his observations further demonstrate the fact that the *quality* as well as the *quantity* of the disease varies in obedience to the circumstances concerning the subsoil water—there being an agreement in the inverse ratio between the case mortality from diphtheria and the range of the movements of the subsoil water" (p. 32).

Mr. Baldwin Latham's researches at Croydon point in the same direction. In a paper read at the International Congress of Hygiene and Demography (1891) Dr. Hewitt, executive officer of the State Board of Health, Minnesota, said—"The earliest records of diphtheria in Minnesota date before 1860, when it appeared in the families of settlers in the valley of our great rivers as a severe and often malignant tonsilitis, with much glandular enlargement and severe systemic disturbance. From the low lands it spread to the high lands, following the border of the forest, and thence to the prairie, till it invaded nearly every inhabited section of the State." (Trans., vol. I., p. 108.)

(*b*) Of polluted soils it is easy to get many instances associated with outbreaks. The Michigan report, already quoted, has these: "Unaccountable, unless traceable to the low water and decaying vegetation in and along the banks of the Looking-glass river;" "from swamps and standing water;" "swimming in stagnant water."

(*c*) Of damp dwellings the instances are very numerous. It

may, I think, be taken as proved that, given the presence of the diphtheria bacillus, diphtheria, as an epidemic disease, is likeliest to strike the low-lying, damp districts, the polluted soils and the damp houses. Dr. Gibert of Havre, in an analysis of diphtheria in Havre for the decade 1880-89, confirms these conclusions. "The commune of Gravilles," he says, "was annexed to Havre in 1855, and this was a heavy charge for Havre. It was only little by little, slowly, that the streets could be drained, paved and kept up. For long years the only sewer was the street gutter, and the bed of clay that occupies the subsoil made this particularly moist." As a result diphtheria was very plentiful and very fatal.

3. *Absence of Light.*—As a result of Professor Ramsay's superb address at Glasgow, the general public ought to begin to believe in the death-effects of light on bacteria. Both in town and country, however, the favorite geranium or begonia and the care of the furniture will, for years to come, combine to rob light of its microbicidal terrors. In towns, moreover, the insane structure of houses almost invariably leaves some important living part in total or partial darkness—stairs, rooms, closets, water-closets, food presses, clothes presses are, often as not, constructed regard less of light. This matter our Dean of Guild Courts might do something to improve; but fashions in architecture are, like fashions elsewhere, frequently more apt to change than to be changed. It is, of course, difficult to isolate the direct effects of light; but the direct and indirct effects of the want of light are undoubtedly neglect, dirt and a copious domestic undergrowth of animal and vegetable parasites. The diphtheria bacillus will watch its opportunity like the others. It is proper to add that, where other conditions are favorable, the effect of direct sunlight on the diphtheria bacillus is to shorten its life only by a few days.

4. *Accumulations of Refuse.*—To call diphtheria a filth disease is only an emphatic way of asserting that frequently it is assignable to no other known cause; but to assert that any accumulation of filth as such, whether infected with the specific bacillus or not, will give rise to diphtheria, is only to reject the bacillary theory as incomplete or wrong. If the bacillary theory is accepted, then to say diphtheria is a filth disease is merely to say that filth forms a good medium for the growth and propagation of the organism outside the human body, and that, when the supply of human diphtheritic bacilli goes done, accumulations of filth will always afford a fresh supply. Common sense indicates that, when the organism is not

growing in a human throat or in a laboratory, it may yet be growing in the well-stocked laboratories of organic nature, which, from the point of view of human living, are filth heaps. It is with qualifications like these that we must accept the assigning of diphtheria outbreaks to a filth origin. And there is another qualification of equal importance. The bacillus of diphtheria is very often associated with other micro-organisms, for example, with the organism that produces pus (or abscesses), *streptococcus pyogenes*. This effect was first demonstrated by Professor Alexander Ogston, professor of surgery in Aberdeen University. This organism plays perhaps the chief part in many diseases. Dr. Bulloch has recently re-investigated its history, and he finds it must be reckoned with in erysipelas, pseudo-erysipelas, pyaemia, and septicaemia (that is, forms of blood poisoning), puerperal fever in several forms, in a large number of respiratory diseases, in pneumonia, in typhoid fever, in scarlet fever, in diphtheria, in pulmonary tuberculosis, in many diseases of the nervous system, as in meningitis, in many forms of non-diphtheritic sore thoats, in pleurisy, in peritonitis, in nephritis, in smallpox, in forms of acute bowel catarrh, and in other diseases unspecified. That streptococcus should be found in so many connections proves it to be widely spread in the animal and vegetable kingdoms. Probably many cases of apparent diphtheria are really due to streptococcus alone, and the worst forms of diphtheria as a rule are associated with streptococcus. In any case, streptococcus, or forms of organism related to it are almost universally found in filth, and may prepare the human throat for the reception of diphtheria when, in the absence of the filth-organism, the diphtheria bacillus might have floated by harmless and unharmed. Horses are now immunised against streptococcus, and the effects of the serum on certain diseases have been very striking. It seems likely that the study of streptococcus will produce a greater hygienic revolution than the study either of tuberculosis or of diphtheria. One must keep these considerations in view when one reads, in the Michigan reports of 1892 and 1893, that one outbreak was assigned to "living near a manure heap," a second to "filthy condition of house and premises," a third to "decayed vegetable matter," a fourth to "decayed vegetation in a cellar," and so on. Dr. Lennox Browne points out that in nineteen epidemics investigated by the Local Government Board of England "emanations from accumulations of organic and other refuse" were found. These instances refer to accumulations of

refuse on the large scale; but doubtless street gullies, jaw-holes, unclean traps, street ventilators of badly made or badly flushed sewers must also be counted in, and will, from time to time, be the startingpoint of new outbreaks.

5. *Other Unsanitary Conditions.*—In my paper last year I described instances of the parts played by defective drains, polluted water, and certain other forms of functional and structural mal-adaptation of the social organism. Instances could be multiplied from recent papers and reports; but I have preferred here to extend the less commonly accepted of the conditions that lead to outbreaks of diphtheria. It is enough to say that all arguments regarding drains and their relation to micro-organisms ought to keep in view the elementary physical principles expounded by Dr. Russell in his presidential address to the preventive medicine section of the recent Glasgow Congress.

6. *Milk.*—At the Greenock Congress last year Professor Matthew Hay suggested that the recent tendency of diphtheria to increase more rapidly in the towns than in the country is due to the increased town consumption of country milk. It is accepted that milk is an admirable medium for cultivating the diphtheria bacillus, which in milk, however, according to Dr. Lennox Browne, "probably undergoes degenerative changes with rapidity" He suggests that these changes are due to the formation of lactic (or milk) acid. But milk is rarely retained long enough to render the bacillus harmless. Of the forty-five outbreaks investigated by the Local Government Board up to 1894, only four were assigned to milk, and in three of the four the milk was probably infected from sewage or impure water, not directly from the cow. A recent case that came under my own observation is worth recording. A case of diphtheria had occurred at a dairy. Two or three months later a child had received a drink of cream at this dairy; three or four days later she took diphtheria. Within a day or two of this occurrence another case occurred, and the origin was a casual drink of milk at the same dairy. A day later a third case occurred, and on inquiry the child was found to have consumed some milk from the same dairy. Other cases, so I was informed, occurred in the surrounding district. The three cases named were situated widely apart; no personal contact could be made out; but the three were united in the fact that they had all consumed milk from a dairy known to have been infected. Into the question of direct transmission from a diseased cow I do not enter; but Dr. Klein maintains that a certain

disease of the cow's udder is true diphtheria, and may originate an outbreak of human diphtheria.

7. *Aggregation in Schools.*—Numerous other elements in the causation of diphtheria I must meanwhile leave alone; such are personal disposition, habit, occupation, varieties of personal contagion. Some of these are perhaps more strictly medical than hygienic. But no paper on the causation of diphtheria can omit some reference to the effect of schools on the origin and development of diphtheria outbreaks. Since Dr. Thorne Thorne framed his indictment against the overcrowding of elementary schools, and attributed the recent rapid increase of diphtheria in England to the compulsion of the Education Act, opinion has been much exercised on the precise proportion of occurrences legitimately assignable to the schools. And the opinions of good authorities do not all accord with Dr. Thorne Thorne's. That the aggregation in schools increases the opportunities for the disease to spread is a proposition firmly established; it needs no statistics of cases or outbreaks to prove it; the natural history of the disease is itself adequate proof. Dispute, however, arises when it is contended that the schools are to blame for an exceptional proportion of occurrences; that, indeed, the aggregation of children in schools is one of the main causes for the persistent propagation of diphtheria. The latest contribution to this complicated question is the paper by Dr. W. R. Smith on "The Prevalence of Diphtheria in London and elsewhere." Dr. Smith has made elaborate analyses of the statistics, not only of England in general, but of the London School Board schools in particular. His principal conclusion is that the schools are only a minor cause in the spread of diphtheria; that the part they play has been much exaggerated, and that, as diphtheria prevails most among children of less than school age, the schools have been unjustly blamed. "From the facts represented in these three diagrams," says Dr. Smith, "it is impossible to resist the conclusion that no special liability to diphtheria can be traced to the beginning of school attendance. In fact, the ages which are now the most subject to the disease would still be the most subject if aggregation in schools were abolished altogether. It may or may not be that the decrease of liability would commence at age 4-5, and would go on more rapidly in succeeding years than it really does; but the steady increase of liability at ages 1-2, 2-3, and 3-4 would remain practically unaltered." (*Journal of State Medicine*, May, 1896.) To analyse fully or counter-argue the figures that form the basis of

this conclusion is beyond my present scope; but it seems to me that, if the figures do prove the conclusion, they are in danger of proving too much. The conditions of school life and life in towns are so complex that statistics are for the present to be taken with caution. And that for the following reasons:—

(*a*) The infective period of diphtheria is very indefinite. It varies from weeks to months. Loffler found the bacillus in the throat after three weeks, six weeks, and longer. Two French observers found the bacillus persisting in a child's nose for fifteen months. It is thus extremely difficult to declare when a diphtheria patient is free of infection. Any statistics based on a fixed period of infectivity are necessarily misleading. This indefiniteness of the infective period makes it in the mass of cases practically impossible to trace the origin of the disease. Thus, of the 2,168 cases analysed in Dr. Smith's paper, "no source of infection was discoverable in 1,618 cases;" that is, nearly seventy-five per cent. of cases were of unknown origin. To estimate the value of these cases, therefore, would require a good deal of more minute investigation. Of the outbreaks recorded in the Michigan reports the majority remained a mystery.

(*b*) The life of the diphtheria bacillus outside the body is indefinite. No period has yet been fixed. Flugge says—"In thick dried layers the germs remain alive for three to four months; in imperfectly dried, up to seven months." Reys found by experiment that "the diphtheria bacillus is destroyed by desiccation in the presence of sulphuric acid in twenty-four hours, while with ordinary desiccation they will remain alive for several days in cloth, silk, or paper, for more than two weeks in sand, and up to one hundred days in powdered mud. When these latter media are moist, the resistance extends over a longer time, reaching to more than one hundred and twenty days in the case of sand." (*Journal of State Medicine*, July, 1896, p. 350.) The air may thus become a carrier of infective dust.

Before the statistics affecting schools can be accounted reliable, the two considerations I have indicated must receive full value. So long as patients may remain infectious for weeks after apparent recovery, and rooms for months after moderately thorough disinfection, the study of the disease must proceed less by statistics than by simple physics. Both American and French authorities declare that a room once thoroughly infected with diphtheria can be rendered safe only by repeated disinfection and prolonged ventilation.

In these illustrations I have sought only to indicate the opinions of the day and the range of labor still open before the men engaged in the practice of hygienics. The more clearly the natural history of diphtheria is known, the more definite become the practical measures for its extirpation; but, however well known the habits of the bacillus are, the end of its disease-effects is yet a long way off. But the note of hope in this tangled wilderness does not fail us; the invincible desire "to follow knowledge like a sinking star" will carry us "beyond the utmost bounds of human thought," and, in the meanwhile, the practical men among us remain "strong in will to seek, to strive, to find, and not to yield."—*The Sanitary Journal, Nov.*, 1896.

HIGH BUILDINGS AND SAFE ELEVATORS.

To the European traveler in the United States at the present day there is probably no more striking feature than the prevalence of high buildings in large cities. We do not refer by this so much to the wonderful structures of 16 or more stories, of which both New York and Chicago can boast a considerable number, but to the buildings of eight, ten or twelve stories, of which great numbers exist in all our large cities, such as Philadelphia, Boston, and St. Louis, and which are becoming quite a prominent feature even in such minor cities as Pittsburg or Buffalo. The social and economic results which come from the prevalence of high buildings are of great importance. It is of enormous advantage in the conduct of business, for example, enabling a very great number of people to be concentrated in a small area, and yet giving them an abundance of light and air, and room for convenient work. Take for example the central business district of Chicago. If all the business in this district were to be transferred to buildings not more than five stories high, it would be necessary to cover an area more than twice as great. The added difficulty and cost of carrying on business when such an extended area is included in the business district are evident.

For an example on the other side we may take the city of London. As is well known, the area which the old city of London covered, now commonly known as "The City," is almost wholly given up to business; but the vast amount of business transacted on this limited area coupled with existing restrictions as to height of buildings (few office buildings being more than five or six stories

in height) has compelled a crowding which an American would find most irksome and inconvenient. The contrast between the spacious and well lit offices of an American firm in a modern office building and the cramped and dimly lighted quarters which satisfy a London firm doing a similar amount of business, is one which has often been noted.

Now, while rigid building laws in European cities are partially responsible for the absence of high buildings there, it is also true that the high buildings of American cities are made possible only by a notable American invention, the fast passenger elevator. Its development has been as rapid as has the development of the high building itself, and had this not been the case, it is certain that the latter would not have taken place. We should not see a 30-story building in process of construction in New York to-day, for example, if the elevator builders had not made great advances over the slow moving machines that were in common use 15 years ago.

But a matter not less important than the features of speed and reliability is the matter of safety. It is only because it has been possible to convey passengers up and down a vertical shaft with almost, perhaps quite, as small a percentage of casualty as occurs in travel on a railway, that the elevator has become so popular. There is a sensation of risk in moving swiftly up or down a vertical shaft, and only habit and experience of its safety dispels it. But if once a serious accident occurs to an elevator, fears are aroused, people resort to stair climbing and tenants begin to look with more favor on buildings of lower height.

From this point of view the recent accident to an elevator in the 22-story building of the American Tract Society, reported in our last issue, is of importance to every one interested in any way in high buildings, or their construction. It would take only a few such accidents, should they chance to occur at about the same time, to seriously shake public confidence in the general safety of elevator service; and should this take place, the investment in present high buildings and the construction of additional ones might be seriously affected. In other words, it behooves elevator builders and those responsible for the safety of existing elevator plants to spare no pains to keep the standard of safety at its highest, not only to make safe their own business, but the investments and business of thousands of others.

Reviewing now briefly the circumstances of the accident in the Tract Society building elevator, it appears that in the design of this plant, a high-pressure hydraulic system, using water at a pressure

900 lbs. per sq. in. was accepted in place of the lower pressure, about 150 lbs., commonly employed. It will be apparent that by this means it was possible to materially reduce the size of the hydraulic cylinders, and thus the space taken up by the elevator plant. This was, of course, an important matter in so large an installation.

In published statements the builders ascribe the troubles which have been experienced with these elevators to the use of this system; but it appears doubtful to an engineer whether this is the sole or even the main reason for the accident. Ever since these elevators were put into service there has been difficulty in operating them. With the best care on the part of the operators they have found it difficult to run the elevator cars smoothly and to stop them at a floor landing at exactly the right point. It can easily be believed that the valves controlling the movement of the hydraulic plungers were not so well proportioned as those which the builders had for years used on low-pressure work, and to which they were accustomed; but that is hardly a fault of the high-pressure system. An accident which occurred some months ago, in which a car dropped suddenly a story or two, we have heard ascribed to air in the cylinder, a danger against which every precaution should be taken in a hydraulic elevator system; but it is not apparent why air should be more likely to give trouble here than in a low-pressure system. Again, the recent accident was due to the breakage of a bolt in a check-valve cover; but unless the error was committed of using the same check-valves for 900 lbs. pressure that were used in ordinary low pressure works, it is again not clear what the high-pressure had to do with the accident.

The real cause of the recent accident and the root of the difficulty with which all elevator engineers are now struggling is simply the great rate of speed at which elevators in high buildings are now required to be run. Recent specifications call for a speed of 700 ft. per minute on passenger elevators, or nearly 8 miles per hour, about the speed of a Broadway cable car. The elevator car with an average load and including its counterweight will weigh, perhaps, two tons, and this weight must be started from rest and brought up to full speed in a movement of perhaps 5 ft., must stop from full speed in a similar distance, and must be capable of control by the elevator boy, so that it can be stopped at the floor level within a fraction of an inch. Besides this, the acceleration and retardation must be suitably graduated, else the passengers will be forcibly reminded of a toboggan slide, when the car starts down, and will

feel as if their avoirdupois had suddenly and uncomfortably increased when the car shoots up.

The difficulty of difficulties comes in, however, when we take up the design of the safety attachments. Every passenger elevator has, or ought to have, appliances by which, when the normal speed of the car is exceeded, whether from the breaking of the rope, the derangement of the elevator machinery or any other cause, clutches automatically grip the guides at the side of the elevator shaft and bring the car to a standstill. This was an easy enough matter when elevator cars ran 200 or 300 ft. per minute; but when we reach 700 ft. per minute difficulties thicken. There must be a considerable margin between the normal speed of the car, and that at which the safety clutches is set to operate, for variations in the load on the car and the pressure in the cylinders cause large variations in the ordinary speed of the cars. If the normal speed is 700 ft. per minute, we presume the safety clutch could not be set to operate at less than 1,100 or 1,200 ft. per minute, or nearly 12 miles per hour. But the operation of a safety clutch at such a speed is a thing to be done with caution. To bring a weight of two tons or so too suddenly to rest from such a velocity might cripple the elevator guides or cause some other breakage which would make a bad matter worse.

In the recent Tract Building elevator accident, the car did not fall. It merely ran down the shaft at a speed not high enough to operate the safety clutches and struck the buffers at the bottom. Its passengers found by experience that to be brought up with a shock from even such a speed is not unattended with danger.

It was a trifling thing that caused the accident. The breakage of a bolt in a check valve on the pipe leading from the pump to the hydraulic cylinder started a leak, which caused the movement of the plunger, just as if the discharge valve from the cylinder had been opened. But this leak was not automatically closed when the car neared the bottom of its shaft, as the valve would have been, and so the car struck the bottom buffers at full speed. Any other cause which would have started a leak from the cylinder and the system of piping to which it is connected would have been equally effective in causing the accident. In most of the newspaper accounts of the accident, in fact, it was ascribed to the blowing out of a gasket. It doubtless occurred to most engineers who saw these reports that it was a strange sort of engineering that used a gasket which could by any possibility blow out, for the joints of a hydrau-

to elevator system. We presume that metal to metal joints, or at most some form of metallic gasket is used for such connections.

Another fact of importance comes to light in considering this accident. Suppose that the break of this check-valve cover bolt had occurred a moment sooner, just when the elevator car was standing at a floor, and passengers were getting on or off it. The car would have instantly started down and the chances are great that one or more of the passengers would have been caught in the doorway and cut in two. This is a danger which does not seem to be guarded against as it should be in elevator construction. When the car is standing still it is held in position only by the elevator machine, and any break or failure occurring at that time, if passengers are entering or leaving the car, may cause a fatal accident.

It may be urged that the chances are so remote of such an accident occuring that it is not worth while to make provision against it. There is a popular idea that an elevator is a machine so simple and safe that it is very little liable to accident or to getting out of order. In this connection we find some interesting figures in the last quarterly report of the Superintendent of the Department of Buildings of New York city. This department is by law charged with the duty of inspecting passenger elevators. We quote the summary of its work in this field in the first nine months of two successive years as follows:

	Jan. to Sept. —inclus.—	
	1895.	1896.
No. inspections of passenger elevators	2,632	4,257
Defective passenger elevators reported	62	856
Elevators made safe on notice from Dept	44	912
Pass. elev. cases sent to att'y for prosecution	16	182

It is certainly clear from these figures that unless the present inspection is too severe by far, the inspection of a year ago was a highly incomplete and perfunctory affair. Further, the fact that the inspectors of the Building Department should be able to find an average of 95 defects a month in the passenger elevators of this city is surprising and somewhat disquieting. It must be remembered that an elevator plant ought to be and generally is in the charge of competent attendants, who should discover and remedy all defects, regardless of the occasional visits of the official inspector. In addition, a large number of elevators are regularly inspected by private firms who make a specialty of this work. It

will also occur to many of our readers, doubtless, that the above figures show well that safety is not to be found in reliance upon any municipal or state bureau. If we grant that the inspection of 1896 was thorough and effective, what guarantee have we that we may not in a year or two return to the conditions of 1895?

Returning to our statement above that the real cause of present troubles with passenger elevators is the high speeds at which they are required to be run, we are far from saying that because of this fact present standards of speed should be lowered. The speed of 700 ft. per minute, which is the highest now in use so far as we recall, is no more than is actually needed to give sufficiently prompt service to buildings 14 or more stories in height. We do believe, however, that it is the duty of elevator makers, and of the engineers who specify the requirements which elevator makers must fill, to pay more attention to the matter of safety when such high speeds are required.

The most fruitful direction in which to work, it appears to us, is in connection with the safety devices on the car itself. We know of no good reason why every elevator car should not be furnished with a brake, under control of the operator, by which the car could be stopped and held at any point of its travel quite independent of the operating mechanism. If this brake were interlocked with the operating lever, or with some mechanism connected with the doors at the various landings, the car could be held absolutely in place at every stop and the danger of its starting up or down while passengers are entering or leaving, either through accident to the machinery or through the carelessness of the operator, would be wholly done away with. It may also be noted that the common annoyance of cars creeping up or down on account of minute leaks when standing at a floor would be obviated by such an appliance.

A word may be said here also concerning the provision of air cushions at the bottom of elevator shafts. These were in quite general use a dozen years ago, and many remarkable tests were made with them, such as dropping a car several stories without injury to passengers. With the advent of buildings of 12 stories and upward the air cushion idea appears to have been generally dropped. This, again, seems to us a mistake, for an air cushion is not designed to catch a car falling freely from a height of a half-dozen stories or more. Other appliances on the car should prevent any such great speed as would be obtained by a free fall from such a height. But an air cushion would serve a useful purpose in arrest-

ing a car which runs down the shaft as did the car in the Tract Society building without setting the safety clutches.

That the automatic clutch alone is not enough of a safeguard for high-speed elevator service, however, seems to be amply proved. Many of our readers will recollect in the Manufacturers' Building at the Columbian Exposition a set of hydraulic elevators which carried passengers up to the roof of the building, a dizzy height. During the exposition one of these elevators fell with a load of passengers on account of the breaking of the rope. The car fell several feet and then was stopped by the safety clutches, but these released as soon as the car stopped and again it fell, to be again brought up, and so on, till it came to a final stop some 20 ft. above the bottom of the shaft.

BOSTON MEDICAL LIBRARY AUG 12 1899

It is a well-known principle in the operation of safety devices of every sort, that unless provision is made for their regular use or testing, they are very apt to get out of order and inoperative when the emergency comes which they are designed to meet. This is an inherent fault of the ordinary safety attachment on an elevator car. In the regular course of events it is never used during the entire life of the elevator, and it is, therefore, never certainly known whether it will operate effectively when an accident occurs which it is designed to meet. This affords another reason why the plan of having the safety clutch operated by the elevator boy at every stop of the car would furnish additional safety as compared with the present system.—*Engineering News, Nov. 26, 1896.*

A Financial Transaction.—"Say, mister," said a boy, who had just overtaken a market wagon, after pursuing it for four or five blocks, "do you wanter know who hit you in the neck with that hard snowball?"

"You bet I do," replied the man, slacking speed.

"Will ye gimme a quarter if I ketch him and bring him here?"

"Yep."

"Gimme 50 cents?."

"Yes," said the driver, lifting his whip from the socket, "but I won' give you any more'n that."

"Well, git the money ready."

"You haven't got the boy that threw the snowball yet."

"Yes I have. That boy is me. Dad's sick, and me mother can't git work. The twins is too little to earn anything, an' if I don't hustle there won't be any Christmas tree at our house. I'll take a lickin' any day for 50 cents."

"Sonny," said the marketman, in a voice that was remarkably husky, "here's your 50 cents. I'm in a hurry now; yer needn't bother about deliverin' the goods. We'll call it square."

THE PASSING OF THE HOLY-STONE.

"Six days shalt thou work and do all that thou art able;
On the seventh, holy-stone the deck and scrape the iron cable."
—*Old Merchantman Rhyme.*

Another time-honored "custom of the service"—but honored in no other respect than its antiquity—has fallen before a few pen-strokes over the signature of the Assistant Secretary of the Navy—the practice of holy-stoning the decks of men-of-war is to be henceforth abandoned. As commodores and midshipmen were once head and tail of the personnel of the naval service, and sails and spars and tacks and sheets, things without which no man-of-war could be, so was the holy-stone, the sacred possession of the Kaaba of the quarter-deck, which every old shell-back had first detested in his youth and then accepted in his old age, as the thorn in the flesh which it was his lot to wear without repining. This was yesterday; and to-day *Midshipman* Easy might roam the decks with his little hanger and find no messmate; "commodore" is scarcely more than a traditional title; sails and spars have disappeared, reefing and furling are lost arts; and now the holy-stone is for all future time to be anathema. *Maran atha!*

For years before the oldest living medical officer of the Navy received the blue ribboned parchment which constituted him during the pleasure of the President of the United States, an officer of the Navy, to whose orders "all officers, seamen and marines under his command" were "strictly charged and required to be obedient" (pregnant words, though the pregnancy be only phantom)—this venerable stone has been denounced for the unholy uses to which it has been devoted, and now, at last, each old survivor of the conflict can congratulate himself and reverently say: "I have fought a good fight; I have run my course."

The scourge of the sea has not been storm and wreckage, not battle and bloodshed, not typhus and scurvy, ship fever and dysentery, but more murderous than all these, *wet decks*, not decks wetted by raging sea or drenching rain, but deluged daily and deliberately by the pumps under pretense of cleanliness, and this in defiance of the unanimous protest of the medical officers of every naval service on the globe. In vain they showed how this artificial saturation of the ship's atmosphere was inimical to health. They demonstrated by unerring statistics that a *wet ship was always an unhealthy ship*. They pleaded and protested; they suffered insult

and braved court-martial—but the holy-stone kept on grinding out, in daily swing, with sand and water, the lives of men whom wind and sea had failed to mark and mar.

There have been, in recent years, many instances of commanding officers of exceptional intelligence, who have listened to the advice of the medical officers and instituted the practice of shellacking the decks below the water line and cleaning them with hot water cloths and swabs. Captain John McNeill Boyd of the British Navy candidly admitted that "the objections to wet decks are supported by the medical officers with such a weight of evidence that they can not be gainsaid." But the upper decks have suffered the infliction of sand and water and holy-stones until a few weeks ago, when the fulmen of the Department consignd them to the scrap-heap, not because they were insanitary and consequently damnable, but because they wore out the decks and were consequently expensive. *Finis coronat opus*, however it may be accomplished, and hence no sanitarian will repine that the credit be not given to him for having accomplished this crowning achievement of the work of naval hygiene.

The kindred need of marine hygiene, ventilation, has come about through necessity following the construction of the great machine vessels, which have supplanted the white-winged queens of the sea. The almost hermitically sealed floating iron boxes were uninhabitable without constant artificial ventilation established by aspirating tubes and fans, whose motor engines, added to the hundred and more others that fill the interiors of modern battleships and cruisers, encroach upon the air space. With fresh dry air, tempering somewhat the evils of overcrowding, with distilled aerated water, good food and proper clothing, the man of the sea is now far better cared for than his predecessor, Ben Bolt, except when he gets sick or breaks a bone, and then he is stowed away in the same contracted, dark, noisy place in the bows, that is, in American men-of-war, where the din of rattling chains and capstans, the odors of the paint room, and the grime and grease of this region, neutralize anodynes and soporifics and keep him keen to suffering. The sites of the hospitals in other services are chosen because of their fitness for their purpose, but with us the suggestion that "she would be nothing but a damned quarantine hulk and had better hoist the yellow flag at once," was urged in the case of one of our finest modern vessels, when the medical departments ought to

equip her with the same hospital establishment as English, French, German and Russian vessels of her type.

The hostility to their medical associates by line officers is incredible to civilians and perhaps can only be explained by an original underlying jealousy of the acquirements of a corps, whose humanitarian duties and obligations impel its members to persevere in the face of every opposition, until as in the matter of holy-stoning the decks, their humane objects shall be accomplished. Ultimately, the claims of the sick, as of their care-takers, will be recognized and provision be made for them more in accordance with the enlightenment and philanthropy which characterize this age. Much of the disagreement, as in civil life, doubtless depends upon the inability of non-professional men, who are themselves robust and healthy, to recognize the importance of what seems to them to be only trivial fault-finding by their medical associates, and they attribute to cavil recommendations that conflict with their own no doubt honestly conceived ideas. The health officer on shore, and the medical officer on board ship, who is pre-eminently a health officer, have the same up-hill work, but they have at last gained so sure a foot-hold that ere long their views will be heard not in entreaty, but as of those having authority.—*Journal American Medical Association, Nov. 21, 1896.*

WESTPHALIAN HAMS.

The peculiar and excellent qualities which have made Westphalian hams so famous are attributable to three distinct elements connected with ham making: (1) the hogs of Westphalia are chiefly bred for the express purpose of making the most tender meat and the least fat; (2) the manner of feeding and caring for the hogs is a specialty; (3) preserving, curing and last of all, smoking the hams with juniper berries and branches is entitled to careful attention.

There is a special predilection in Westphalia for the raising of the so-called *Ravensberger Kreutzung* (Ravensberg crossbreed). They are rather large animals, with slender bodies, flat groins, straight snouts, and large heads. A special feature of this race is their very big, overhanging ears. Their skin is white and covered with straight little bristles. Another but smaller species is also raised in Westphalia, which is called the *Koenigsberger Landschwein.* This kind, particularly as far as hams are concerned, is not in great favor. Their flesh is not as substantial as that of the

first mentioned breed. In comparison with the Ravensberg hog, their rind is thick and leathery. These pigs are distinguishable by the short, compact frame of their bodies. The head is short, with straight snout; ears are small and upright. Unlike the Ravensberg sort, this hog has a body almost like a roller, resting upon very short and thin legs. The skin is dark colored, the hair not straight.

Manner of Feeding.—First of all it must be stated that the feeding with acorns, though very much in vogue in Westphalia some time ago, is at present not practicable on account of the inability of the oak woods to produce anything like the amount of mast food wanted. Feeding in the piggery is the only way customary nowadays. The principal component part of swine food in Westphalia is potatoes, which are grown in large quantities. Particularly the smaller varieties are used for this purpose. The potatoes are first well cooked and then, with their skin, mashed in the potato water. The pulp thus obtained is thoroughly mixed with wheat bran or with rye, barley or oatmeal in a dry, raw condition. An addition of indian corn is not advisable, because this cereal, according to experience, is said to have an undesirable effect on the production of hams. Pork from hogs which had been principally fed with indian corn shows little firmness, is watery, and not adapted for cure.

Proper care should be taken that the food given to the animals is properly cooled, or else complications in the digestion are much to be feared. It is further advisable that the mass of the food is not too thick by the admixture of bran or meal. It must not tumble in thick masses into the food-trough, but should be in a condition to flow thickly into the trough. In order to avoid an overproduction of fat, and, at the same time further the growth of flesh of young pigs, it is good to add some raw-cut green food—cabbage is the best—to the mixture. In many parts of Westphalia, wherever it is practicable, young pigs get much sour milk and prosper splendidly thereon. Pork of animals fed in this way is savory and of fine color.

In order to promote digestion, it is sometimes good to give the hogs small pieces of soft coal, which they eat with lively appetite. It is a matter of course that from time to time pigs must get fresh, clear drinking water.

Much stress should be laid on cleanliness. Hogs require scrupulous cleanliness if they are to prosper. The sty must

be airy and allow the animals sufficient mobility. It is good to whitewash the walls every year anew. The floor is to be paved in a way that the watery excrements will flow off directly. Further care is to be taken that the beds are kept as dry as practicable; the litter should therefore be frequently renewed. It is of great importance for the welfare of the animals to water or moisten them frequently; particularly during the hot season, a weekly thorough cleaning with soap, water, and a hard brush is alike very much advisable, and is the common practice in many places.

If more value is laid upon the production of flesh rather than of bacon, the animals ought to have much exercise in the open air.

Curing.—The hams are first vigorously rubbed with saltpetre, and then with salt. In order to prevent the spoiling of the hams, as many cuts as can be prudently made are made near the bone and strewn with saltpetre and salt. The hams thus cured are presesd in a pickle-tun and entirely covered with cold salt lye. According to their size, hams should remain in salt from three to five weeks. After this the hams are taken out of the pickle and hung up in a shady, but dry and airy, place, in order to become "air-dry" (*lufttrocken*).

Before the pickled hams can be put in smoke, it is absolutely necessary that they be first exposed for several weeks to the drying in the open air in the way just mentioned. As long as the outside of the ham is not absolutely dry, as long as it appears moist or sticky, it must be kept away from smoke. Only entirely air-dry pieces must be subjected to this way of conservation. Smoking is done in special large chambers, the hams being hung up on the ceiling. On the floor of the smoking room a suitable quantity of sawdust, wood shavings, and, if possible, an addition of juniper bunches, is slowly charred.

Besides juniper, beech and alder woods are used. Oak and resinous woods are to be positively avoided.

The smoking should go on very slowly. It is recommended to smoke for a few days cautiously—that is, to have the smoke not too strong, then to expose the hams for a few days in the fresh air, repeating this way until the hams have become sufficiently brown. Hams should be actually in smoke two or three weeks, and thus the whole process of smoking will take about six weeks.

In Westphalia much value is set upon dry hams. Hams are therefore preserved after their smoking in a room which is shady, not accessible to the light, but at the same time dry, cool and airy.

HENRY F. MERRITT,

BARMEN, September 21, 1895. Consul.

CATTLE PLAGUE IN EUROPEAN RUSSIA.

An elaborate official report has been published on the results of the measures adopted against the spreading of the cattle plague in European Russia during the last twenty-five years.

The plague, from which thousands of cattle perish yearly, is the terror of a Russian landowner, whose property, often only consisting of a few head, is annihilated by it. The Government has fought against this disease with every possible means. In 1876, the Minister of the Interior came to the conclusion that quarantine and the strictest isolation of infected cattle were not sufficiently radical measures for the destruction of the evil; therefore, a number of new regulations were adopted and published, according to which every head of cattle infected with the plague should be immediately killed and burned. This law, however, was put in force only in Russian Poland, and after the lapse of five years a decrease in the spread of the disease was observed. From 1875 to 1879, in forty governments, 180,000 head of cattle were destroyed by the plague, and from 1880 to 1884 it raged to such an extent that in forty-two governments 222,000 head per year were destroyed, so that the Minister of the Interior found it necessary to enforce the regulations in all the forty-two governments, and, from 1885, all over the empire. From that year the plague began to decrease; it appeared only in twenty-eight governments, where the annual average loss of cattle was 141,000 head, valued at $1,452,300. A still greater decrease was observed during the five years from 1890 to 1895; in fact, the disease was disappearing little by little, except in 1891 and 1892—the bad harvest years—when it again increased and invaded the Don region, spreading over the neighboring governments, where it disappeared only in 1894.

During the last five years the loss caused by the cattle plague in the seven infected governments amounted, on an average, to 18,820 head, valued at $193,846 per year. Thus, the loss of cattle from 1887 to 1895 was 253,000 head, worth $2,605,900. But if the plague had continued to rage at its former intensity, the loss in European Russia would have amounted to 1,620,000 head, valued at $16,686,000, so that on account of the strict measures enforced by the Government 1,367,000 head of cattle, worth $14,080,100 were saved to the country. Besides, the Government has paid to the owners of cattle killed the sum of $1,442,000 as indemnity.

Many objections were raised against the killing and burning of the infected animals, it being claimed that the plague would not

cease and that the practice would lead only to ruin of the stock. That such fears were groundless is proved by the official report, which shows what great benefit the measures have secured to the country. From the experience in this country, the only effective measures against the cattle plague is the killing and burning of the infected animals and strict observance of the regulations.

JOHN KAREL,

ST. PETERSBURG, *April 16, 1896.* *Consul-General*

KNEW WHAT HE WANTED.—A sallow individual in a faded brown overcoat sat down on a stool at one of the railway lunch counters the other morning, and said to the proprietor:

"Give me a cup of coffee and one of your expurgated sandwiches."

"What kind?" asked the proprietor.

"Expurgated," rejoined the other. "One of those vacuum sandwiches for which your establishment is justly celebrated."

"I haven't any kind but those under that glass there."

"That's all right. That's the particular variety I want."

He helped himself to one of them and lifted up the upper lid.

"This is what I call a sandwich, nit," he observed, eyeing it critically, yet approvingly. "There's nothing supererogatory about it. It's one of those hiatus sandwiches. It's a sandwich with an alibi," he added, replacing the lid, and studying the outer surface of it intently. "It's an absent sandwich. It's a sandwich that has failed to arrive. I have seen times when I would have given worlds to——"

"Say," interrupted the proprietor, "if you don't like that sandwich you needn't eat it. That's all there is about that."

"Who said I didn't like it? Didn't I call for it? I generally know what I want. For this particular occasion and for this specific luncheon I happen to want one of your negative sandwiches, and like a man, sir, I call for it. Anything wrong about that?"

"You needn't get gay," grumbled the man behind the counter. "Did you order coffee?"

"I did. Give me, if you please, a cup of your best suppositious coffee."

"I've only got one kind of coffee," replied the sulky caterer.

"That's the kind I want. A cup of your universally admired non-existent coffee—your famous nullification coffee. Accompanied, if you please, by a small pitcher of your vague, phantasmal, visionary, depopulated cream. I am fasting to-day."

And while the man in the faded brown coat munched the sandwich and sipped the coffee in a slow, absent-minded way, the proprietor stared at him, and breathed hard and longed to throw him out of the window.—*Chicago Tribune.*

MEDICAL EXCERPT.

By T. P. Corbally, A. M., M. D.

Preventive Treatment of Epilepsy.—Dr. Lemoine, in a recent number of *La Clinique*, says epilepsy is not a morbific reality, but the result of morbific conditions. There are, he says, epileptic conditions which are often symptoms of malformations, lesions or functional defects of the central and peripheral nervous system, and sometimes of other organs in the economy. The number of symptomatic attacks of epilepsy increases daily as clinical experience becomes more extensive and better understood, while that form of cases known as *essential* diminishes. This is a fortunate condition in a therapeutic point of view, for the better the causes of epilepsy are known the better it can be combatted by rational rather than by anti-spasmodic treatment. The doctor who is called to an epileptic patient ought, therefore, before prescribing remedies, to examine all the organs with the greatest care, to see if the disease is not the consequence of some pathological condition which he ought, if possible, to remove from the outset.

In severe cases the patient ought to be subjected to a strict course of moral and physical hygiene. Fatiguing intellectual exertion, reading excessively prolonged, violent or sudden emotions, fits of anger and the like ought, as far as possible, to be avoided. Professions that are exhausting or that require constant activity of thought do not suit his condition.

Sudden and violent changes of temperature, remaining in a place that is too cold or too hot—in a word, violent and sudden physical impressions should be avoided.

He should moderate his appetite, avoid hearty and protracted meals, shun alcohol and strong coffee, watch with the greatest care all the digestive functions, especially those of the intestines. Habitual constipation is the proximate cause of many attacks.

Every epileptic is subject to strong impressions from some particular cause, whether it be moral or physical—these are the causes he must endeavor to avoid with the greatest care.

The author has observed 220 attacks in twenty-four hours in a female patient. Such cases are dangerous and may cause death from violent congestion of the brain and especially of the menin-

ges. He has found most relief from injections of chloral and Rata Brom. *aa;* half a drachm with yolk of egg and milk.

ADDISON'S DISEASE.—MM. Eitlenger and Nageotte presented a report (*Le Progres Medical,* 5th of December) to the Societie de Biologie on "Lesions of the Central Nervous system in the intoxication following experiments in Addison's Disease (removal of the capsules)." Death always follows the removal of both the suprarenal capsules in animals, and is accompanied with symptoms of paralysis. Abelous and Langlois have demonstrated that it is a case of auto-intoxication. The hystological study of the central nervous system shows that there exists cellular lesions which may be made to prove this, by means of new cytological methods. The lesions consist in deep changes: 1st. In the chromatophile substance of the plasma which is disintegrated as if reduced to powder. 2d. In the achromatic substance, which is deeply fissured in its central parts, accompanied with a general tumefication and a thickening of the protoplasmic prolongations. The cells of the entire cerebro-spinal axis are attacked, those of the brain as well as those of the cerrebellum and the spinal cord. It is quite justifiable to assume as fully established that there is an intimate relation between these lesions and the nervous symptoms accompanying the intoxication in Addison's Disease.

STREPTOCOCCI GENERALLY DIFFUSED.—M. Ch. Levy reports to the Societe Anatomique de Paris (*La Revue Medicale,* 15th October) the case of a child three weeks old attacked with erysipelas of the gluteal region, in which free injections of the serum of Marmorek were made. At first a slight improvement seemed to follow. Abscesses containing the streptococci soon developed in the neighborhood of the punctures, and soon afterwards the erysipelas reappeared. Injections were repeated; coma and death followed.

The autopsy showed the presence of streptococi in all the viscera, the liver, the spleen, kidneys, etc. The skull was removed and very thick sub-arachmoid exudation was found filled with streptococci.

This is probably the *erysipelas neonatorum* of the older writers, which has been said sometimes to accompany the birth of the child. In a case attended by the writer the disease began in a child ten days old and proved fatal at the end of the third week. Convulsions followed by coma preceded death.

RESEARCHES ON CHLOROFORM.—M. P. Reynier continues (*La France Medicale,* Nov. 20) to entertain a decided preference for

chloroform, the use of which in practice is much more convenient than that of ether. Patients recover from the effects of anesthetics very differently. A careful examination of each patient previous to the application of the anesthetic will enable the operator to judge of the effects that are likely to result, before the application is made.

Applying chloroform under normal conditions the cerebral cells are the first to yield to its influence; next, the cells of the medulla, and then the cells of the bulb. According to the greater or less resistance of these different cells, fatal accidents follow the application of chloroform. In alcoholic patients, the cells of whose brains are in a constant condition of hyperesthesia, evidences of delirium may be observed which may go on to delirium tremens. In hysterical subjects all the different forms of an attack of hysteria may be observed, and the effects may advance to the condition of paralysis or even of syncope. The same results will be observed in epileptic subjects. In morphinamaniacs but slightly intoxicated some patients are rapidly and easily brought under the influence of chloroform; in others, on the contrary, its use is most dangerous. In patients suffering with attaxia the period of medullary excitement almost always gives rise to reflex action, which may cause the arrest of respiration and of the movement of the heart.

These accidents, which occur in the early stages of the application of chloroform, may also take place at the conclusion of the operation; therefore the patient should not be left without strict observation until he has completely recovered from its influence.

INTUBATION OF THE LARYNX.—Professors Robert and Llorente y Magdalena, of the Bacteriological Institute of Madrid, have presented (*El Siglo Medico*, November 1 and 8), a lengthy and interesting communication to the Real Academia de Medecina de Madrid on Intubation. The following are their conclusions:

1st. The simultaneous use of intubation and the anti-diphtheritic serum-therapy, gives the best results in the treatment of croup.

2nd. The results of intubation are without doubt much superior to tracheotomy; statistics prove this fully.

3d. The members of the Microbiological Institute of Madrid have performed intubation in 31 cases, which they have presented to the Society, and which show its great superiority to tracheotomy.

4th. The families of the patient will accept intubation when they would obstinately refuse to permit tracheotomy; many children, for this reason, die without surgical assistance.

5th. The complications following tracheotomy are, undoubtedly, greater in number, and far more serious, than those attributed to intubation.

6th. Intubation is more easily performed, needs no special assistants, and requires no greater care than after tracheotomy.

7th. The facial appearance of the child on whom tracheotomy has been performed is far more pitiable, under equal conditions, than that of one in whom intubation has been employed.

8th. The use of anti-diphtheritic serum, even in cases in which the presence of the diphtheritic bacillus has not been confirmed, is entirely harmless.

They claim the following results from the study of their statistics:

Of the 31 cases treated with intubation, 10 died. Allowing for three deaths, which occurred a few hours after the introduction of the tube from paralysis of central origin, there results 75 per cent. of recoveries.

The following cases deserve special mention: 1st. Five of the cases were children under two years of age. 2nd. In many of the cases in which the tube was introduced, tracheotomy would have been impossible and fatal. 3d. In the majority of the deaths from broncho-pneumonia, the intubation and the use of the serum were not employed until the 8th or 10th day after the inception of the disease. The great majority of the cases treated with intubation were among very poor families. 5th. And in most of the cases treated with the serum, surgical interference was not necessary.

FISH POISONING.—Brosch (*Wien. Klin. Woch*) reports the first case of poisoning by oysters which has proved fatal (in twenty-two hours).

Symptoms.—Vomiting, giddiness, paralysis of certain muscles (paralysis of deglutition, dilatation of one pupil, ptosis, obliteration of naso labial furrow, paralysis of accommodation, larynx, bladder, with general weakness). Consciousness was preserved till death, which was due to paralysis of respiratory muscles.

Post-Mortem.—Brain and pia mater edematous; small punctiform hemorrhages in cerebellum and lower dorsal and upper lumbar region of cord; numerous petechiae or pericardium and pleurae; mesenteric glands, intestinal follicles, and Peyer's patches not enlarged; spleen enlarged; fatty degeneration of hepatic cells and parenchymatous degeneration of cardiac muscle and renal cells. No micro organisms found in the spleen or spinal cord, and cultures were sterile. On analysis of contents of stomach,

small intestine, and bladder, no mineral or vegetable poison was found, but ptomaine-like bodies were present which had no special characteristics.

Thirteen similar cases of fish poisoning have been published. The symptoms are like those of one form of meat poisoning, but the course is much more rapid. The post-mortem descriptions of all agree except as to changes in the lymphatic system and the presence of hemorrhages. The latter simply depend on the mode of death, and are present if it is from asphyxia, absent if from collapse. The symptoms are also characteristic:

(1) Progressive development of isolated muscular paralysis, the only difference in the cases being the number of groups attacked and the intensity of paralysis. Paralysis of deglutition and general weakness almost always appear first, then disturbances of vision, the other paralysis coming on in no constant order.

(2) Giddiness is always present, and gives the appearance of drunkenness, but consciousness is preserved till death in all but very rapid cases.

(3) Temperature normal or very slightly raised.

(4) Pain frequently absent.

(5) Death is due to respiratory paralysis, if it does not occur from collapse.

Excluding some cases of poisoning by mussels, where in the slightest form there is urticaria, and in the most severe form muscular cramps, loss of consciousness, and death, poisoning by meat or fish occurs as two distinct groups: (1) true gastro-enteritis with high fever and colic, and generally ending in recovery (due to intestinal bacterial infection); (2) the form described above.

Besides the obvious differences, diarrhoea is present in the first, while in the second there is constipation, caused by intestinal paralysis. This division is of great importance with regard to prognosis and treatment.

In the gastro-enteric form purgatives and intestinal disinfectants must be given, in the severe toxic cases they are useless on account of the paralysis.

CONTAGIOUS IMPETIGO.—William S. Gotthiel, M. D., refers to this (in *Pediatrics*, October, 1896) as a self-limited contagious disease of children, appearing in localized epidemics and first described by Tilbury Fox in 1864. Accompanied by a moderate fever and some gastric disturbance there appear on the face and hands groups of flat vescicles filled with transparent or cloudy se-

rum. These dry up into characteristic golden yellow crusts, which fall off in two or three weeks, leaving circular, reddened non-ulcerated areas behind. Successive crops of vescicles may prolong the disease for two months or more. It is undoubtedly parasitic; but, though Kaposi claims to have found it, the etiological factor is still unknown. The treatment consists in removal of the crusts with olive oil compresses, cleansing the skin with hot water and soap, boracic acid solution, etc., etc., followed by the use of Lassar's paste:

R. Acid Salicylic.....30 grains.
Petrolati ..... 1 ounce.
Zinci Oxidi .....
Amyli .....*a. a.* ½ ounce.

THE UNTOWARD EFFECT OF SUBSTITUTES.—A. M. Collins, A. M., M. D., of Shelbyville, Ill., writes under date of November 2d, 1896: "I never realized the vast difference between genuine antikamnia and the various substitutes that are being palmed off until within the past few days, and the realization was all the more pronounced because I myself was the patient. For four weeks I had been suffering with neuralgia of a very severe type, and attended with considerable febrile movement. I tried the various compounds and other preparations lauded as 'just as good,' but with no real advantage and with no little heart disturbance. I went to Arcola, and while there was taken very sick with one of my neuralgic attacks. I sent to the drug store for some genuine antikamnia, and, to be certain about it, procured an unbroken original package. I took it in eight to ten grain doses at intervals of two hours. The effect was magical. The first dose relieved the severity of the pain, while the second quieted it entirely; and I went to bed, sleeping all night with one awakening of a few moments only, a thing I had not done in four weeks. This experience on my own person has thoroughly convinced me of the superiority of the genuine antikamnia."

PAT'S PERSONAL HISTORY.—At the convention of the Irish race last month in Dublin, two speakers, who had come from the United States, contributed the following sentences in the course of their speeches: One of them, in giving some details of personal history, informed his hearers that "he had left Ireland fifty-three years before, a naked little boy, without a dollar in his pocket." Said the other: "Until last week, I had never set foot in the land of my birth."—*Argonaut.*

EDITOR'S TABLE.

SANITARIAN, JANUARY NUMBER, 1897.

☞ ALL correspondence and exchanges and all publications for review should be addressed to the Editor, DR. A. N. BELL, Brooklyn, N. Y.

THE SIGNIFICANCE OF MORTALITY FROM CONSUMPTION WITH REGARD TO THE BICYCLE.—At a recent meeting of the American Statistical Association, Dr. S. W. Abbott, Secretary of the State Board of Health of Massachusetts, presented some figures regarding the proportion of pulmonary tuberculosis in females to that in males in Massachusetts. The rate in 1851 was 1,451 females to 1,000 males; in 1890, 1,055 females to 1,000 males; and in 1895, only 974 females to 1,000 males. 1895 was the first year in the history of the State in which the number of deaths from phthisis in females was smaller than that in males. The fact that a uniform reduction in the rate of female deaths began some five years ago, about the same time women were beginning to ride the bicycle extensively, Dr. Abbott considers significant, and he is inclined to attribute the decrease in the death-rate to the great increase in open air exercise among women by the use of the bicycle.

DANGER OF STANDING WATER, that is, water that is left standing in the kitchen or bedroom, and above all, in the sick room, over night, is liable to contamination by the absorbtion of impurities afloat in the air in such rooms and to be rendered wholly unfit for use. No matter that the water is cold, even to near freezing, it is so much the more liable to absorb and hold in solution the foul gases and organic particles to which it has been exposed. It is dangerous to use such water. Water should not be so left; but if it should by chance so to be, it should be thrown away. *Freshly drawn* water only should always be used for culinary purposes, as well as for drinking, whenever practicable. Moreover, the faucets over sinks and wash basins are always more or less liable to contamination, hence the first water that flows on opening them after they have been left all night without use, should always be let flow away—it is dangerous to drink and unfit for the tea-kettle, or for cooking water; even boiled disease germs are unwholesome.

THE HIDEBOUND—WHICH?—According to published report (*Registered Pharmacist* for November), the Woman's Christian Temperance Union has purchased land in Chicago upon which is to be erected a hospital, to be called the National Temperance Hospital, "inside whose walls not one drop of alcohol to be used for medicinal purposes is ever to find its way, nor can any physician cross the threshold as a practitioner until he has pledged himself to abstain from prescribing alcohol in any form for any patient who may come under his treatment within the wards of the building."

"We shall show the doctors who think that in some cases the administration of alcohol is a necessity to save a patient's life," said one of the promoters of the enterprise, "that they are utterly mistaken, and that before our work in the new field is a year old we can present facts in the shape of cured patients which will change the mind of many a physician, no matter how hidebound he may may be in his prejudice!"

Upon which the *Pharmacist* remarks: * * * "If the use of the ordinary tinctures and tonics is to be permitted, the new hospital will not be so different from others established long ago.

"It is no uncommon thing to read newspaper interviews which quote certain physicians as saying they never prescribe alcohol in any form, but who, nevertheless, very frequently prescribe such preparations as tincture conchona compound, etc., and in quite liberal and oft-repeated doses, which does not seem quite consistent. Possibly the promoters of the new hospital may not fully understand what excluding the use of alcohol in any form for medicinal use really means."

A TEST OF MASONRY LAID IN FREEZING WEATHER was made recently in Riga, Russia. The climate of Riga is cold enough to satisfy any requirements for such a test, and the experimental piers were exposed for several years to the weather, so as to show decisively the resistance of the different sorts of frozen mortar. Fourteen piers were laid, some with ordinary and some with very hard bricks, some with lime and sand alone, some with the addition of salt, some with Portland cement and lime, and one with Portland cement alone, to five parts of sand. This pier proved far stronger than any of the others. The bricks were laid wet and warm, and the cement, which was of a slow-setting variety, hardened without difficulty, although the work was exposed to a temperature below

the Fahrenheit zero. Years afterward the pier rang clearly on being struck, and the bricks were with difficulty separated from the mortar, the iron bar used to loosen them sometimes breaking the brick rather than the mortar. Of the other piers, those laid with a mortar of three parts lime to one of Portland cement and nine parts of sand stood best, an iron bar being required to loosen the bricks. In this case, also, the bricks were laid wet and warm. The addition of 1¾ per cent. of salt to the water used for slaking the lime made, with three parts of sand, a mortar which resisted frost successfully, here, as before, the bricks being laid wet and warm. Except with cement, however, the wetting of the bricks does not seem to have been essential, for piers laid with dry bricks showed nearly or quite as much resistance as the others. It was found, however, that the hard-baked "iron bricks" gave much better results, either wet or dry, than common bricks, so that the absorption of the water from the mortar by porous bricks, laid dry, is evidently a thing to be avoided in cold as well as in warm weather.

"LODGE DOCTORING."—The Associated Physicians and Surgeons of Santa Clara Valley, California, have taken praiseworthy action against "the pestiferous practice of lodge doctoring," a system which, on investigation, shows that medical compensation for lodge work averages about fifteen cents on the dollar. The Association, including every physician in the Valley and numbering 124 members, in a population of 70,000, has adopted resolutions denouncing the practice and pledging themselves not to render medical or surgical services to the members of any lodge, society, association or organization for less compensation than they charge the general public for similar services.

HON. WM. P. LETCHWORTH, for twenty-three a member of the State Board of Charities, has resigned his office, and Mr. Harvey W. Putnam, of Buffalo, has been appointed to fill the vacancy. Mr. Letchworth was president of the board for a number of years, and during the entire period of his membership, no matter in what capacity he has served, he has been a consistent, devoted and able worker in the cause of organized charity, giving his time and money freely for the betterment of the poor, the insane and even the criminal. We hope his advice will still be available to the State, even though he has felt compelled to retire from active labor. Mr.

Letchworth's whole life has been an exemplification of the precept, "And the greatest of these is charity."

PETTENKOFER.—This world-famed sanitarian and biologist has been honored by a grant of permission to assume the title of Excellency. This reward, says the London Medical Press and Circular, may not be appreciated by practical persons as a fitting distinction for a great scientist, but it is, at least, a more reasonable recognition of merit than the baronetcy offered, in such cases, by our own government, a distinction which few great scientists are in a position to accept, and which, if they do so, may be made ridiculous after their deaths by the antics of descendants whom the nation has never desired to honor.

THE METROPOLITAN LIFE INSURANCE COMPANY has made some changes and improvements in its endowment policies which give to them an increasing value. All policies issued on lives between the ages of ten and seventy, provide for an addition to their face each year after the third of an amount of insurance and endowment equal to ten times the weekly premium; that is, for a weekly premium of ten cents one dollar per year will be added to the face of the policy, payable to the insured at maturity, or to his heirs in event of death. Ten cents per week at age twenty will purchase an endowment of $154, and at end of twenty years this will have increased to $171; at the end of forty years $191, and at the end of sixty years, when it matures, to $211. To infantile endowments—that is, on ages between two and nine years, corresponding amounts are added annually after the insured reaches the age of twelve, and these endowments are payable in forty-four to sixty years, according to age at entry. The adult policies are payable in from ten to seventy years, depending on age at entry. This feature will make the Metropolitan's endowments more popular and attractive than ever, and serves to illustrate the progressiveness of this company.

MORTALITY AND MORBILITY REPORTS AND REVIEWS.

HEALTH OF THE NAVY.—*Report of the Surgeon-General, U. S. Navy, Chief of the Bureau of Medicine and Surgery, for the fiscal year ending June 30, 1896; and statistical report showing the health of the Navy for the year 1895.*

The report embraces a statement of the condition of the hospital fund, the naval medical establishment, and other matters of interest pertaining to the duties of the Bureau of Medicine and Surgery.

The naval hospitals, navy-yards, naval stations and receiving ships are considered in detail with reference to the health of their occupants severally, together with the progress of changes and adaptations to their betterment, and with a few exceptions there appears to have been marked improvement during the year. The most glaring exceptions are the continued unsanitary condition of the marine barracks and prison at the Boston navy-yard, and the defective sewerage system that still obtains at Portsmouth navy-yard, which have been dwelt upon in previous reports.

The Museum of Hygiene has been greatly improved—the structure and grounds, and the internal arrangements. The library building has been almost entirely rebuilt; the library inventoried, checked and classified, and now is available for ready use. Many additions have been made during the year. Much work has been done by the officers of the museum, requiring considerable research and labor.

The hygienic care of ships and the prevention of epidemic diseases have been subjects of careful investigation and report. Examinations and reports have been made on materials and supplies, new inventions, etc. One hundred and ninety-two large photographs were made for the office of the Secretary of the Navy. In the chemical laboratory thirty examinations of water supply and one hundred and seventy examinations of urine, blood, milk, etc., were made for the service, in addition to the examinations rquired in the progress of the museum work. The necessary bacteriological cultures for these examinations have also been made.

"An institution like this can never be finished. Growth and progress are essential to its usefulness. As a central national museum of sanitary science, it should be second to none in the world. The co-operation and aid of naval officers and all sanitarians are desired and invited. The more complete the collections are made the greater are the benefits to be conferred."

"*The Naval Laboratory and Department of Instruction* for junior medical officers, preliminary to entering upon active service, has been attended with the most satisfactory results.

"Besides affording the young officers a practical insight into their professional studies, it gives them an opportunity of becoming conversant with the usages and customs of the service and familiarizing themselves with the duties of medical officers, afloat and on shore, without which preparatory instruction they would be confronted with serious difficulties and placed at a disadvantage in the performance of their duties."

Vacancies in the Medical Corps continue to be a standing reproach to the naval officers of the line for their opposition to, and to Con-

gress for neglectful legislation of, such improvement in the social relation and rank of medical officers in the navy as would render the service more attractive. The record of the last fiscal year in this respect is nearly a repetition of the preceding year. There were 341 applications concerning the conditions of appointment, to which replies were promptly sent. Out of the number, only 36 applied for permission to present themselves for examination, and of these, 22 only reported. Four of these were rejected on account of physical defects; twelve were rejected professionally, leaving but six out of the 341 applicants. "This state of affairs has existed for years and will undoubtedly continue until there is some favorable legislation for junior medical officers in the Navy.

"At this date there are 10 vacancies in the grade of assistant surgeons, and the Bureau is embarassed by not having a sufficient number of medical officers to filll important stations ashore and afloat."

Statistical Report.—The average strength of the Navy and Marine Corps, including Cadets at the Naval Academy for the year 1895 was 13,191. Complete returns were received by the Medical Department from a total force connected for time, 12,671.

The total number of admissions for disease and injury was 10,625—838.53 per 1,000 of average strength. The ration for disease was 673.19 and for injury 165.34. Daily average of patients was 434.23, a ratio of 34.27 per 1,000; the number of persons invalided from service (including retirements for disability) was 206: 15.61 per 1,000. The total number of sick days was 158,495, an average of 12.51 days for each man of the Navy and Marine Corps and of 14.92 days for each case treated. The number of deaths was 90—70 from disease and 20 from injury (including poison). Death rate 6.82 per 1,000 of strength (5.31 for disease and 1.51 for injury).

During the year there were admitted to the sick list of the total force 913 cases of malarial diseases, 657 of epidemic catarrh, 632 of rheumatic affections, 503 of diarrhoeal affections, 187 of alcoholism, 92 of heat stroke, 63 of pneumonia, 42 of pneumonic tuberculosis, 36 of measles, 31 of typhoid fever, 25 of organic heart disease, 17 of nephritis, 13 of erysipelas, 6 of varicella, 3 of scarlet fever, 2 of cholera, and 1 each of mumps and smallpox. Of the 913 cases of malarial diseases returned from the whole service nearly one-fourth (213) occurred in Washington, D. C., at the navy-yard and marine headquarters (pages 35, 42, and 52). Of the 92 cases of heat stroke 58 were caused by heat in fire and engine rooms, 23 of

the latter being returned from the Amphitrite, 8 from the Detroit, 7 from the Raleigh, 3 from the Columbia, and 2 each from the Bennington, Atlanta, Monterey, and Olympia, the remainder (9) occurring scattered, 1 on a ship. There was no case of yellow fever in the Navy during the year and but two cases of cholera, one being returned from the Bennington and one from the Machias (pages 45 and 47). The case of smallpox developed in a patient transferred from the Columbia to the hospital at Norfolk. The venereal diseases were represented by 330 cases of gonorrhoea, 239 of syphilis, and 152 of chancroid. There were 637 cases of wounds, 469 of contusion, 418 of sprain, 116 of burn, 96 of fracture, 44 of hernia, 40 of abrasion, 16 of concussion, 14 of luxation, and 9 of drowning. The prevalence of these special diseases and injuries on the various stations is shown in the detailed statement of the health of each station.

The deaths in the total force were due—10 each to pneumonia and heart diseases; 8 each to drowning and local injuries; 7 each to pneumonic tuberculosis and nephritis; 6 to typhoid fever; 5 to apoplexy; 4 to aneurism; 3 each to intestinal obstruction and poison; 2 each to bronchitis, pleurisy, peritonitis, and cholera, and 1 each to cholera morbus, dysentery, remittent fever, rheumatism, suffocation in boiler, appendicitis, asthma, hepatitis, heat stroke, epidemic catarrh, and meningitis.

Deaths by violence and suicide 18.

During the year 5,173 persons were vaccinated, and the total percentage of success was 24.37; 4,176 of these had marks of previous vaccinations and furnished 935 successful results.

Of the force afloat—10,049: The average number of admissions to the sick list per man on the cruising vessels of the North Atlantic Station was 0.99; on those of the Pacific Station, 0.75; in the South Atlantic squadron, 0.93; in the European squadron, 0.83; in the Asiatic squadron, 0.78; on the Northwestern Lakes, 0.35, and on the receiving ships and other stationary vessels, 0.62.

Insane of the Navy.—The number of patients from the Navy and Marine Corps remaining in the Government Hospital for the Insane on June 30, 1895, was 69. During the following year 26 cases were admitted and 16 discharged, 7 as recovered, 3 improved, 1 unimproved, and 5 dead. On June 30, 1896, 79 (8 officers and 71 seamen and marines) remained in that institution.

Of the new ships afloat, insufficient ventilation and common—in some cases total—disregard of conditions necessary to the proper

care of the sick and wounded are striking defects. The following are examples extracted from the medical officers' reports:

The Baltimore: "The compartment used as a sick bay is the after torpedo room on the orlop deck. While at sea the ventilation is not good and the motion excessive. The transportation of the sick or wounded to the bay is difficult, and those able to walk must pass through a bunker, an engine room, a workshop, and a passageway."

The Columbia: "While inspecting the ship, I found the temperature in the wardroom storeroom 95° F.—a temperature destructive to canned goods and wine. The peculiar construction of the ship necessitates the establishment of two stations for the wounded, one in sick bay forward and the other in the wardroom aft, and in battle there would probably be another in the superstructure."

The Indiana: "The sick bay bathroom is unprovided with hot water. * * * Some of the valves of the water closet leak, and flushing is defective. The ship's head is in close proximity to the sick bay, and the odor from it is at times offensive; in summer or hot weather at sea, this might be a serious danger to the sick."

The Charleston: "The dynamo room is an interior compartment below the protective deck, without any natural ventilation. In order to carry off the overheated air a small electric fan was put in several years ago with ducts leading to the ship's rail. Finding that this did not accomplish the purpose, it was suggested that a ventilator be run to the spar deck. Instead, however, two 16-inch vents were cut through the protective deck, making direct communication with the forward torpedo room, a proceeding which resulted in pouring a sufficient volume of hot air into that compartment to render it untenable for sleeping in warm weather, but not enough to materially benefit the dynamo room, where, in summer, the temperature still averages about 120° with two dynamos in action, and 140° with all three. * * * The prison is an interior compartment on the protective deck, and the only access to it is through a hatch in the forward 8-inch gun support; in consequence of which all the air that reaches it comes from the berth deck, where it has already been vitiated by respiration. The entire compartment measures but 825 cubic feet, and two cells for solitary confinement of 180 cubic feet each have been constructed in it, leaving only 445 cubic feet for the accommodation of ordinary prisoners. Naturally, with a crew of such size, it frequently happens that a number of men have to be placed under sentry's charge and

otherwise confined. Even one person should not be placed in such an environment for any length of time. * * * War ships must have prisons, but they should be constructed with proper regard for sanitation."

The Texas: "The sick quarters are located on the berth deck forward, between the first and second water-tight bulkheads, in a torpedo compartment, the chains and anchor engine being overhead. Only two cots for sick men can conveniently swing, and have room for a table and space to move around. A wire cage stores two torpedoes along one side and takes up much of the floor space. The sick bay is also a thoroughfare to the torpedo tube compartment, next forward in the bow. * * * The ship is insufficiently equipped with evaporating and condensing machinery, and at no time thus far has been able to supply enough fresh water for common daily uses."

The Detroit: "There is no sick bay, but the sick are swung near the dispensary, where they are quiet and comfortable." But there is lack of breathing space. "Air space per man (in cubic feet): Forecastle 98½; berth deck—first compartment 97, second compartment 73, third compartment 95½, fourth compartment 85½. * * * The location of the dynamo room is bad for constant work. * * * the temperature fluctuating between 110° and 120°, depending on the outside temperature."

The Cincinnati: "The average temperature for the year, with any fires in the fireroom, 145.8°—the range (tabulated) being 91° to 200°"!

The Monterey: "At Sea, April 16, 1895.—Within the past three days several firemen have presented themselves for treatment, suffering from exhaustion after their watch in the fire room. * * * The temperature of the fire room last night was 135°, of the engine room 100°, of the dynamo room 108°, and of the pump room at the last turning of the turrets 194°. * * *

"I deem it my duty," the surgeon reports to the commanding officer, "to point out to you that there is grave danger of collapse in performing duty in these high temperatures like that in the pump rooms, and in such atmosphere as is now present in the double-bottom spaces."

The report altogether is replete with practical knowledge, eminently commendable to the naval constructors and to the officers of the line who have had the supervision of the constructive work of the new navy.

ALABAMA.—W. H. Sanders, M. D., State Health Officer, Montgomery.

Mobile, 31,076: J. A. Abrams, M. D., Health Officer, reports for October: Deaths, 81—25 under five years of age. From consumption, 14; annual death rate, 25.68.

Selma, 7,622: J. A. McKinnon, M. D., Registrar, reports for November: Total mortality, 17, of which 4 were under five years of age: annual death rate, 20.46 per 1,000.

CALIFORNIA.—J. H. Davidson, M. D., President, Los Angeles; J. R. Lane, M. D., Secretary, Sacramento. The Secretary reports for November: Returns from 49 cities, towns, villages, and sanitary districts, aggregating a population of 737,180, show a mortality of 899—an annual death rate of 14.40 per 1,000.

There were 136 deaths from consumption, 81 from pneumonia, 21 from bronchitis, 8 from congestion of the lungs, 9 from *diphtheria* (and croup), 19 from *typhoid fever*, 12 from cerebro-spinal fever, 40 from cancer, 72 from diseases of the heart.

San Francisco, 330,000. Reports for November: Deaths, 463—106 under five years of age. From consumption, 63; acute pulmonary diseases, 55; from xymotic diseases, 41; annual death rate, 16.80.

As the result of contention between the Board of Health and the Board of Education, with regard to closing the schools as a means of preventing the spread of diphtheria, the Board of Health's attorney has made an examination of the law of the case and finds that the Board has no power to close public schools which it has reason to believe are hotbeds of disease and are spreading death among the children in attendance upon them!

Los Angeles, 100,000. Reports for November: Deaths, 101—19 under five years of age. From consumption, 21; acute pulmonary diseases, 10; from zymotic diseases, 16; annual death rate, 12.12.

COLORADO.—*Denver*, 150,000: William P. Munn, M.D., Health Commissioner, reports for November: Deaths, 40, of which there were from typhoid fever 19 cases reported, 11 deaths; diphtheria, 39 cases, with 5 deaths; scarlet fever, 18 cases; from consumption, 33; pneumonia, 12; annual death rate, 11.2.

December 11 (*News*).—Two large schools are closed on account of the prevalence of diphtheria.

CONNECTICUT.—Professor William H. Brewer, Ph. D., New Haven, President; Professor C. S. Lindsley, M D., Secretary,

New Haven.—The Secretary's bulletin for November comprises reports from 165 towns in the State, with an aggregate population of 852,540, from which the number of deaths reported for the month was 983. The death rate for the larger towns is 14.3; for the smaller, 12.4, and for the whole State, 13.8. Deaths from zymotic diseases, 143—14.5 per cent. of the total mortality—chiefly from diphtheria (54) and typhoid fever (24).

Prospective Ice Supply.—F. J. Kingsbury sums up in the Waterbury *American* (Nov. 30) the sources as follows:

Torrington sends down the sewage of its 8,000 people to Thomaston, which adds its 5,000 and sends the sewage of 13,000 to Waterbury, which adds its 40,000 and passes it on to Naugatuck, which adds 8,000 more, and now, with the sewage of over 60,000 people, this one small stream takes its pollution into the pond at Seymour, whence many persons do, or lately did, obtain their supply of ice; and so on to Ansonia, Derby, and the sea. But this is only one case in many. In the same manner New Britain, the Farmington Valley, extending as far as Winsted, and all the Connecticut River towns bring their filth to Hartford, whence it sometimes pumps its water-supply, adds its own sewage from 75,000, and passes it on to Middletown and the others below it. Danbury sends the sewage of its 20,000 through the flat meadows and sluggish waters of Still river into the Housatonic, which, having been already contaminated by Pittsfield, Great Barrington, and all the factory villages in that neighborhood, rolls its polluted flood into the great pond at Shelton, there to settle and reek and breed microbes for the infection of the atmosphere of the cluster of cities near its borders. The same story must be told of Willimantic and Putnam and all the villages along the Shetucket and Quinnebaug that carry their pollutions down to Norwich and New London.

DELAWARE.—F. W. Cooper, M. D., President, Camden; E. B. Frazer, Secretary, Wilmington.

Wilmington (*News*), Nov. 26.—The Board of Health has received reports of 20 cases of diphtheria in the city, although in all probability the actual number exceeds the report. In one family five persons are down with the disease.

"The Health Officer's Report," etc., next following the paragraph beginning "*Wilmington*," in our December number, was a careless transposition by the printers, unnoticed by the proofreader. District of Columbia should have headed this paragraph and followed the Delaware report.

DISTRICT OF COLUMBIA.—White, 187,600; colored, 87,900—275,500. W. C. Woodward, Health Officer.

Diphtheria continues prevalent; over 100 cases reported present December 4, 7 reported the day before.

FLORIDA.—Hon. W. B. Henderson, President, Tampa; Joseph Y. Porter, M. D., State Health Officer Jacksonville.

Pensacola, 15,000: A. Grant, Secretary, reports for November 26 deaths—6 under five years of age. Annual death rate, 20.8. Consumption caused 4 deaths and typhoid fever 4.

Smallpox is again (*News*, Nov. 28) causing some excitement, two cases being on hand. Energetic measures have been instituted, to prevent its spread.

IDAHO.—The *Statesman*, Idaho Falls, reports the prevalence of *diphtheria* in a most malignant form in *Moscow*, proving fatal in two or three hours.

ILLINOIS.—William E. Quine, M. D., President, Chicago; J. W. Scott, Secretary, Springfield.

Chicago, 1,619,226. William R. Kerr, Commissioner. Report for November: Deaths, 1,568—553 under five years of age. From diphtheria, 87; typhoid fever, 60; whooping cough, 10; consumption, 174; other tubercular diseases, 20; annual death rate, 11.77. Nov. 14-Dec. 3: Diphtheria reported prevalent in Madison county, Bloomington, Ipava, Deer Creek and Canton.

INDIANA.—Douglass C. Ramsey, M. D., President, Mount Vernon; J. N. Hurty, M.D., Secretary, Indianapolis.

Diphtheria continues prevalent in many places.

Nov. 14-28: Reported in a number of localities in Northern Indiana, Russiaville, Portland, Clinton, North Manchester, Camden, Columbus, Centre Point and Lafayette.

IOWA.—E. H. Carter, M. D., President, Des Moines; J. F. Kennedy, M. D., Secretary, Des Moines.

Davenport, 31,484.—A. W. Cantwell, M. D., Physician, reports for November: Number of deaths, 29—6 under five years of age. Death rate per 1,000, 11.6. Zymotic diseases caused 2 deaths and consumption 1.

Des Moines, 60,000: Report for the fiscal year 1896. The number of deaths was 639 and a death rate of 7.20 per 1,000. (*Register*, Des Moines), Nov. 13. Reports sent in to the State Board of Health show that diphtheria cases are so numerous all over the State as to be alarming.

KANSAS.—T. E. Raines, M. D., President, Concordia; T. Kirkpatrick, M. D., Secretary, Westphalia.

Nov. 14-Dec. 1: *Diphtheria* is reported alarmingly prevalent in the towns of the southwestern part of the State. There are so many cases in Garden City that the schools and churches have been closed. At McPherson the Mayor has issued a proclamation that the churches, Sunday schools, public schools and other places of public assemblage be closed, and calling upon the citizens to unite in all measures of precaution to stay the advance of the disease.

Nevertheless, says the Topeka *Capital*, one of the leading newspapers of the State, December 8: "The Populists, in looking over the jobs under the State administration, have found something that makes them very indignant. It is the fact, a Populist said yesterday, that the Secretary of the State Board of Health draws a salary of $2,000 per year 'for doing nothing but sit around the office.' Now the Populists propose to introduce a reform in that department by doing one of two things. The first proposition is to abolish the board, although that would hardly do, as there are so many Populists who want office."

KENTUCKY.—Joseph Matthews, M. D., President, Louisville; J. N. McCormick, M. D., Secretary, Bowling Green.

November 27th: The Glasgow *Republican* reports the alarming prevalence in Coral Hill and Hiseville county of what is termed black erysipelas. Dr. B. W. Smock, of Woodburn, Sanitary Inspector of the State Board of Health, and several other physicians, have visited the district, and all of them agree in pronouncing this fatal disease *erysipelas*, of a malignant type. Up to the present date none of the cases have gotten well, but it is believed by the physicians that perhaps 50 per cent. will yet recover. The disease is highly contagious.

LOUISIANA.—R. S. Oliphant, President, New Orleans; G. F. Patton, M. D., Secretary, New Orleans.

New Orleans, 275,000—80,000 colored: Deaths in October, 352; colored, 104—161 under five years of age, 54 colored. Deaths from consumption, 64; pneumonia, 28; bronchitis, 14; cholera infantum, 11; enteritis, 10. Death rates—Whites, 21.66; colored, 30.10; 23.82.

MAINE.—C. D. Smith, M. D., President, Portland; A. G. Young, M. D., Secretary, Augusta.

Lewiston *Journal*, Dec. 2: *Diphtheria* in the most virulent form has broken out in Town Hill, and it is probable that the schools

will be closed. The town authorities have burned the shanty in which the disease first broke out and taken the family in charge. Last winter this family was stricken with typhus fever, and, lacking the necessities of life, the mother, father and six children were sick at the same time, and the mother and two children died.

In Portland also *diphtheria* is reported prevalent.

MARYLAND.—John Morris, M. D., President, Baltimore; John S. Fulton, M. D., Secretary, Baltimore.

Baltimore, 506,398—75,301 colored. James F. McShane, M. D., Health Commissioner, reports for November: Deaths, 634—482 white persons and 152 colored. Death rates: Whites, 13.42; colored, 24.32: 15.03; 138 were children under five years of age. Deaths from consumption, 53; pneumonia, 45; typhoid fever, 21; diphtheria, 33. Cases of infectious diseases reported, 288.

Diphtheria is reported prevalent in Wicomico and Powellsville.

MASSACHUSETTS.—H. P. Walcott, M. D., Chairman, Cambridge; S. W. Abbott, M. D., Secretary, Boston.

Boston, 501,083: S. H. Durgin, M. D., Chairman. Deaths in August, 1,134—485 under five years of age. Annual death rate, 27.15 per 1,000. From diphtheria, 28; typhoid fever, 13; consumption, 122; accident, 40. Cases of contagious diseases reported for the month: Diphtheria, 256; measles, 100; scarlatina, 42; typhoid fever, 110.

The Spitting Nuisance.—December 8th: The Boston Board of Health has had the following notice placed in every street car of the city: "The Board of Health hereby adjudges that the deposit of sputum in street cars is a public nuisance, source of filth and cause of sickness, and hereby orders that spitting upon any floor of any street car be, and hereby is, prohibited.

"(Chapter 80, Section 18, Public Statutes.)

"The Board of Health of a town shall make such regulations as it judges necessary for the public health and safety respecting nuisances, sources of filth and causes of sickness.

"Whosoever violates such regulations shall forfeit a sum not exceeding $100."

Diphtheria is reported prevalent in East Boston, Salem, Marlboro and Clinton.

MICHIGAN.—Hon. Frank Wells, President, Lansing; Henry B. Baker, M. D., Secretary, Lansing.

The Secretary reports for the month of October, 1896, compared with the preceding month, pneumonia and pleuritis in-

creased and diarrhoea and typhoid fever decreased in area of prevalence. For the month of November, 1896, compared with the average for November in the ten years, 1886-1895, pleuritis and diphtheria were more prevalent, and intermittent fever, remittent fever, consumption, inflammation of kidney and diarrhoea were less prevalent. Including reports by regular observers and others *consumption* was reported present in Michigan in the month of November, 1896, at 230 places; *diphtheria* at 79 places; *typhoid fever* at 76 places, *scarlet fever* at 44 places; *measles* at 33 places and *whooping cough* at 19 places. Reports from all sources show *consumption* reported at one place less; *diphtheria* at 17 places more; *typhoid fever* at 45 places more; *scarlet fever* at 3 places more; *measles* at 13 places more and *whooping cough* at 3 places less in the month of November, 1896, than in the preceding month.

Restriction of Typhoid Fever.—At the October meeting of the State Board of Health, attention was given to a new method for diagnosis which will enable a bacteriologist, in a few hours, to decide whether or not a given case of sickness is typhoid fever. The report was sent to localities in Michigan, and the method has been successfully tried in Kalamazoo. The Health Officer of that city has lately (Dec. 12, 1896) issued a circular supplying to the physicians in Kalamazoo the "outfit" for this process, which is a very simple one and which, it is hoped, will make it possible as early, often, as the third day of the fever to decide that a given case is typhoid fever, when the proper measures can be promptly taken for the restriction of the disease and for the prevention of other cases from the same source.

Detroit, 275,000.—Samuel P. Duffield, M. D., Health Officer, reports for the month of November: Deaths, exclusive of still-births and non-residents, 295—127 under five years of age. Death rate, 13.05. Status of contagious diseases: *Diphtheria*, last report, 45; new cases, 168; died, 42; now sick, 56. *Scarlet fever*, last report, 19; new cases, 55; died, 3; now sick, 48. Measles, last report, 19; new cases, 43; died, 3; now sick, 23.

The "*dead*" end, but the persistent *nuisance* sewerage system that still obtains in Detroit is a constant subject of contention between the Board of Public Works and the Board of Health. The utter impracticability of effectually flushing such a system is apparent to every competent observer. Yet the Board of Public Works state (Detroit *Tribune*, Nov. 29) that they "have thoroughly cleaned 27 lateral sewers during the past season."

In reply to this statement the Sanitary Engineer of the Board of Health says: "I do not know the condition of each of these 27 laterals at the time they were cleaned, but some of them are known to have been so completely stopped as to prevent all flow in the service drains of abutting property. * * * The accumulation of filth is dangerous to health long before the sewer becomes completely filled, and except during periods of frequent heavy rains, such accumulations can only be prevented by frequent flushing from water mains or from tanks. The construction of manholes at the end of lateral sewers furnishes an outlet for bad odors wherever the accumulations are such as to produce sewer gas, which, in some cases, have been so offensive that residents in the vicinity state that they were obliged to stop the holes in the manhole cover."

This abominable filth-accumulating system was described in THE SANITARIAN sixteen years ago.* It was constructed without reference to—indeed, evidently without knowledge of—its relation to the public health, and the succeeding boards of public works ever since have persisted in its maintenance, notwithstanding its deadly effect. By so doing they have become *particeps criminis* in the promotion of infectious diseases and the mortality therefrom.

Coldwater is to be congratulated on having organized a board of health independent of politics, elected as its executive officers Dr. T. J. Turner (Medical Director U. S. Navy, retired), who will be very sure to know nothing among them save the duties of his office and how to execute them. If supported as he should be and has the promise of so being, Coldwater will ere long be a model town of practical sanitation. Dr. Turner has already entered upon the duties of his office (Coldwater *Republican*, Dec. 11), designated the conditions of the city by a carefully prepared map showing the relation of specified localities to disease, enumerated the houses which and how many of them use the city water, and such other conditions of families and schools as are already or are liable to become signal lights for the Sanitary Inspector.

MINNESOTA.—Franklin Staples, M. D., President, Winona; C. N. Hewitt, M. D., Secretary, Red Wing.

St. Paul, 215,000: Alexander J. Stones, M. D., Commissioner, reports for November: Deaths, 96—28 under five years of age. Annual death rate per 1,000 was 5.35. Deaths from diphtheria, 8; typhoid fever, 5; consumption, 9.

Minneapolis, 225,602: H. N. Avery, M. D., Commissioner, reports for November: Deaths, 143—46 under five years of age.

*Vol. 8, p. 281. The Sewerage System of Detroit, by W. F. Craig, C. E.

Deaths from diphtheria, 13; consumption, 17; typhoid fever, 4. Annual death rate, 7.1.

An important decision of the Supreme Court has been rendered recently, sustaining the milk and dairy ordinance of the city of Minneapolis, providing for inspection of dairy herds outside of the city and the use of the tuberculin test.

November 20 (*Journal*): *Typhoid fever, measles* and *scarlet fever* are all raging in Neche and Gretna. The public schools are closed in St. James on account of *diphtheria.*

MISSOURI.—F. J. Lutz, M. D., President, St. Louis; Willis P. King, M. D., Secretary, St. Louis.

St. Louis, 570,000—31,000 colored. M. C. Starkloff, M. D., Commissioner of Health, reports for November: Deaths, 632—196 under five years of age. From diphtheria, 33; phthisis, 74; typhoid fever, 71; diarrhoeal diseases, 31. Annual death rate per 1,000: White, 12.57; colored, 22.0.

Kansas City, 165,000: George A. Coffin, M. D., Sanitary Superintendent, reports for November: Deaths, 142—42 under five years of age. From diphtheria, 10; typhoid fever, 2; phthisis (and tuberculosis), 19. Annual death rate, 10.32.

Nov. 11-25: *Diphtheria* reported prevalent in Sedalia and Mexico.

MONTANA.—Butte City (*Miner*), Nov. 12: Coroner Richards made the astonishing declaration last evening that in his opinion there were fully 100 cases of *diphtheria* at present in the city of Butte and its immediate vicinity. The fact that the water now dished up to the people of Butte is the vilest the city ever had to endure calls attention to the general health of the city. It is reported that there is also an alarming amount of *typhoid fever* in town, and it is the general opinion that the bad water has much to do with it.

NEBRASKA.—J. V. Beghtol, M. D., President, Friend; F. D. Haldeman, M. D., Secretary, Ord.

Omaha, 140,452. Reports for October: Deaths, 95. Death rate, 8.4.

Communicable diseases reported: Diphtheria, 38 cases, ten deaths; scarlet fever, 21 cases, one death; typhoid fever, 8 cases, five deaths.

NEW HAMPSHIRE.—G. P. Conn, M. D., President, Concord; Irving A. Watson, M. D., Secretary, Concord.

Portsmouth (*Times*), Nov. 20: The fact cannot longer be concealed that *scarlet fever* and *diphtheria* are on the increase in this city, and the Board of Health met this morning to take action on the same.

NEW JERSEY.—C. F. Brackett, M. D., President, Princeton; Henry Mitchell, M. D., Secretary, Asbury Park.

Hudson County: *Jersey City* and vicinity, 338,671.—W. W. Varrick, M. D., President. During October there were 432 deaths, of which 162 were under five years of age. Annual death rate, 18.3 per 1,000. Diphtheria caused 31 deaths; scarlatina, 1; typhoid fever, 5; pneumonia, 49; bronchitis, 20; consumption, 62

Newark, 215,725: Health Officer Chandler reports for the four weeks ending November 28: Deaths, 290—107 under five years of age; from diphtheria, 14; consumption, 31; pneumonia, 29. Annual death rate, 17.45.

Paterson, 103,020: J. L. Leal, M. D., Health Officer, reports for November: Deaths, 121—40 under five years of age; from diphtheria, 16; consumption, 10; pneumonia, 9; typhoid fever, 5. Annual death rate, 11.56 per 1,000.

Cases of contagious diseases reported during the month: Scarlet fever, 11; diphtheria, 66; typhoid fever, 67.

Nov. 10-Dec. 7: *Diphtheria* reported prevalent in New Providence township, Camden, Phillipsburg and Nutley; *typhoid fever* in Trenton.

NEW YORK. — Daniel Lewis, M. D., President, New York; B.T. Smelzer, M. D., Secretary, Albany.

The Secretary's *Bulletin* for October reports: The decrease in the mortality from all causes from preceding month, 500; and 600 less than that of October, 1895. The estimated death rate is 16.00 per 1,000 of population annually, against 17.50 in September and 17.20 in October, 1895. Among zymotic diseases the number of deaths from *diarrhoeal diseases* is unusually small and is diminished from 1,077 in September to 338, a saving of 740 deaths; this decrease is distributed over all parts of the State. From *diphtheria*, on the contrary, while compared with the mortality of a year ago, it is less for the month by 100; there is an increase from 294 deaths in September to 361; this increase occurs in all parts of the State except the central and southern, but is chiefly due to local outbreaks in Ogdensburg, Edgewater, New Brighton, Albany, Hudson and Buffalo, with several other smaller places; its prevalence is reported from thirty-five towns in the northern and eastern parts

of the State. In New York city there were fewer deaths than in September, but it has increased in Brooklyn and Long Island. *Diphtheria* caused less than 2.00 per cent. of the mortality in the rural towns and 4.5 per cent. of the urban mortality. *Scarlet fever* is reported as prevalent from 25 towns in the southwestern counties; 35 deaths occurred, which is a slight increase over last month. *Typhoid fever* has slightly decreased; it caused 3.5 per cent. of the rural mortality and 2.00 per cent. of the urban. From *acute respiratory* diseases the mortality is excessive, the 1,123 deaths reported being 300 more than either that of the preceding month or the corresponding month of last year. From other local diseases the mortality is diminished. The mean average temperature was 47°, which is 3° below the normal,and has fallen from an average of 61° in September. There was an unusually small number of fair days, and the average mean relative humidity and mean dew point were high, being respectively 76 per cent. and 40°, the rain fall being, however, deficient, the average total being two inches. Northwest winds generally prevailed, of moderate velocity, in the northern part of the State being southwesterly.

New York City,1,995,000.—Report for October: Deaths, 2,863 —1,026 under five years. Death rate, 17.00. Zymotic diseases, per 1,000, from all causes,118.40; diphtheria, 87; typhoid fever, 39; consumption, 383; acute respiratory diseases, 428; diarrhoeal diseases, 121.

School Sanitation.—The Board of Health has recently taken another pioneer step for the protection of the health of school children—*daily inspection* at the time of assembling by competent medical inspectors. After thorough investigation the board has satisfied itself that "a material reduction in the number of cases of sickness and death from contagious diseases can be secured by a daily inspection of the pupils of each school by a medical inspector and by ascertaining whether children absent from school are sick with contagious or infectious diseases." * * * For example, in one case a baby was reported dead from diphtheria, and her brother was found to attend a class in which diphtheria cases were occurring; subsequently this boy was himself found to be suffering from true diphtheria and to have infected another child in an adjoining apartment as he had infected his sister. The investigation shows that in cases, by no means infrequent, where one or even two children of a family have been fatally stricken with diphtheria another child of the same family has continued to attend school, afterward developing the disease himself and infecting others among his

schoolmates. In thirty-seven cases of measles discovered during the first three weeks of October, in a designated district, twenty-four were contracted in schools.

This board's example—in doing away with slates, pencils and sponges as a means of protection against diphtheria—has been very generally followed in other cities and is making headway in country schools. It is much to be hoped that this example, too, will be followed by the boards of health and the school authorities generally.

Brooklyn, 1,100,000.—Report for October: Deaths, 1,565—516 under five years. Death rate, 17.00. From zymotic diseases, per 1,000, from all causes, 143.15; diphtheria, 99; typhoid fever, 28; consumption, 193; acute respiratory diseases, 218; diarrhoeal diseases, 51.

Report for 11 months, ending November 30: Smallpox, 1; measles, 318; scarlet fever, 132; diphtheria (and "croup"), 1,175; whooping cough, 173; typhoid fever, 158; septic fever, 184; diarrhoeal disease, 1,683; tubercular disease, 3,152; cancer, 491; old age, 385; meningitis, 672; pneumonia, 2,333, and nephritis, 1,309; total, 20,835.

Cases of diphtheria are reported to have been more numerous, but the ratio of mortality from it less, on account of the improvement in the treatment. Evidently no progress has been made in stamping out the chronic epidemic.

Buffalo, 350,000.—Report for October: Deaths, 355—159 under five years. Death rate, 12.17. From zymotic diseases, per 1,000 deaths, from all causes, 250.70; diphtheria, 35; acute respiratory diseases, 61; consumption, 26; diarrhoeal diseases, 26.

Rochester, 170,000.—Report for October: Deaths, 178—53 under five years. Death rate, 12.56. From zymotic diseases, per 1,000 deaths, from all causes, 105.60; consumption, 21; acute respiratory diseases, 19.

Albany, 100,000.—Report for October: Deaths, 140—33 under five years. Death rate, 16.80. From zymotic diseases, per 1,000 deaths, from all causes, 157.60; typhoid fever, 5.

Syracuse, 100,000.—Report for October: Deaths, 109—27 under five years. Death rate, 13.10. From zymotic diseases, per 1,000 deaths, from all causes, 100; consumption, 15: acute lung diseases, 14.

According to more recent reports (Nov. 14-Dec. 1), *diphtheria* is increasingly prevalent in Rochester, Plattsburg, Cohoes and Clifton Springs, and *measles* severely epidemic in Utica.

NORTH CAROLINA.—George G. Thomas, M. D., President, Salem; Richard H. Lewis, M. D., Secretary, Raleigh.

November bulletin summarizes reports from 26 towns, with aggregate populations of 84,272 white and 60,463 colored, for the month of October. Deaths, 95 white, 128 colored. Death rates, respectively: 13.5, 25.4; 18.4. The chief causes were: From diarrhoeal disease, 28; consumption, 29; typhoid fever, 19; malarial fever, 15; pneumonia, 10.

OHIO.—S. P. Wise, M. D., President, Millersburg; C. O. Probst, M. D., Secretary, Columbus.

Cincinnati, 350,000: J. W. Prendergast, M. D., Health Officer, reports for November: Deaths, 432—112 under five years of age. Death rate, 14.81 per 1,000; from diphtheria, 24; typhoid fever, 11; consumption, 46; pneumonia, 47.

Cleveland, 330,279: J. L. Hess, M. D., Health Officer, reports for November: Deaths, 346—125 under five years. From diphtheria, 38; typhoid fever, 11; consumption, 15; pneumonia, 23. Death rate, 12.43.

Toledo, 137,780: J. T. Woods, M. D., Health Officer, reports for November: Deaths, 111—30 under five years of age.

Nov. 15-Dec. 5: *Diphtheria* reported increasingly prevalent in Cincinnati and Cleveland; prevalent in Columbus, Bellefontaine, Piqua, Marietta, Butler, Newark, Salem, Canton — indeed, throughout the State.

OKLAHOMA.—Guthrie, Dec. 14: *Diphtheria* epidemic about Hopeton, in Woods county, still prevails. The faith-cure people, who compose the majority of the community, in spite of quarantine orders, persist in holding public meetings at the houses where the disease exists, and physicians sent out by the authorities have been compelled to use force in order to examine the sick.

PENNSYLVANIA.—Pemberton Dudley, M. D., President, Philadelphia; Benjamin Lee, M. D., Secretary, Philadelphia.

Philadelphia, 1,188,793: Theodore B. Stulb, Health Officer, reports for four weeks ending November 28: Deaths, 1,521—455 under five years of age. From diphtheria, 106; typhoid fever, 28; consumption, 161; pneumonia, 177.

Pittsburg, 280,000: Report for the four weeks ending November 28: Deaths, 339—128 under five years of age; typhoid fever, 20; consumption, 17; diphtheria, 29. Death rate, 15.7.

Nov. 16-Dec. 15: *Diphtheria* is reported prevalent in Phillipsburg, Allentown, Bradford, Kimberton, Monongahela, Westgrove,

Nanticoke, Braddock, Conshohocken, Millvale and Tamaqua; *typhoid fever* in Allegheny and Ridgway.

RHODE ISLAND.—A. G. Sprague, M. D., President, River Point; Gardner T. Swarts, M. D., Secretary, Providence.

Providence (Dec. 4): The rapid spread of diphtheria and scarlet fever has at last influenced the city authorities to take such steps as will, it is hoped, check both those diseases, and that of typhoid fever. Twelve new cases were reported at the Health Office this morning, of which three were diphtheria, four scarlet fever and five typhoid fever.

SOUTH CAROLINA.—*Charleston*, 65,165—white, 28,870; colored, 36,295. H. B. Horlbeck, M. D., Health Officer, reports for four weeks ending November 28: Deaths, 107—78 colored. Under five years of age, 30. Annual death rates—white, 9.45; colored, 30.80: 21.43.

SOUTH DAKOTA.—*Mitchell*, Nov. 27: *Diphtheria* is prevalent, and in many towns roundabout.

TENNESSEE.—J. D. Plunkett, M.D., President, Nashville; J. Berrien Lindsley, M. D., Secretary, Nashville.

The Secretary's bulletin reports: The principal diseases named in the order of their prevalence, in the State, for the month of October were: Malarial fever, typhoid fever, lung diseases, acute consumption, whooping cough, diphtheria, dysentery, la grippe, measles, chicken-pox and cerebro-spinal meningitis.

UTAH.—*Salt Lake City*, 48,076: W. T. Dalby, M. D., Health Commissioner, reports for November: Deaths, 47; from typhoid fever, 5; diphtheria and scarlet fever, one each; consumption, 5. Diphtheria is prevalent in Milford.

VIRGINIA.—R. W. Martin, M. D., President, Chatham; A. Irving, M. D., Secretary, Richmond.

Richmond, Nov. 13: *Diphtheria* and *scarlet fever* are prevalent in this city almost to the extent of epidemics. There were a larger number of cases reported during October than were ever known for one month in the history of the Health Department.

The grave danger of epidemics of both these diseases has been seen by physicians for several weeks past. The Health Department has, in a quiet way, been urging householders to keep their premises clean, as cleanliness is a important safeguard against these terrible diseases.

WASHINGTON.—*Spokane*, Nov. 18: Dr. Potter, the city Health Officer, reports that during the past sixteen months there have been 147 cases of *diphtheria* in the city. Of them 26 have resulted

fatally. Of the entire number of cases all but six have been in places where there was no sewerage.

WISCONSIN.—Solon Marks, M. D., President, Milwaukee; U. O. B. Wingate, M. D., Secretary, Milwaukee.

Milwaukee, 260,000: Walter Kempster, M. D., Commissioner of Health, reports for October: Deaths, 296—135 under five years of age. From *diphtheria*, 48; consumption, 21. Annual death rate, 13.66 per 1,000.

November 21: *Diphtheria* reported increasingly prevalent in Menasha.

CANADA, Nov. 12-20: *Diphtheria* reported increasingly prevalent in Montreal, Toronto, Guelph, Quebec and Lachine.

Winnipeg, Nov. 30: Two cases of *smallpox* have developed in a party of 100 immigrants. Vaccination has been promptly undertaken for the rest.

OBITUARY.

DR. FRANCIS HUNTINGTON RANKIN, who died at his home in Newport, R. I., November 9, 1896, was born in Fishkill-on-the-Hudson, N. Y., September 25, 1845. His father, Robert Gosman Rankin, was a prominent lawyer in New York city. His mother belonged to a family distinguished in the colonial and revolutionary history of the country. He pursued his classical studies at the College of the City of New York and took his diploma as doctor of medicine at the medical department of the New York University in the spring of 1869. Shortly after he went abroad and spent a year in the hospitals of Vienna. At the breaking out of the Franco-Prussian war in 1870-71, he went to Berlin and received an appointment as acting assistant surgeon in the Prussian army, being stationed in the large military hospital in the suburbs of Berlin. After serving there for a short time he became acting full surgeon. After returning to America he received the "steel medal of thanks" from the Prussian government.

He began the practice of medicine in New York city in the summer 1871, and during the first year held the position of assistant sanitary inspector of the New York Board of Health.

In the summer of 1876 Dr. Rankin removed to Newport, where he gained an extensive practice. From the outset of his residence in Newport he took an interest in the sanitary condition of the city, was a member of the Newport Sanitary Association, and was, from its inception, one of the council. He was also one of the attending physicians of the Newport Hospital. The doctor was connected with the Business Men's Association, was a member of the Newport Historical Society and of the Natural History Society.

BOOK REVIEWS.

THE LAW OF PUBLIC HEALTH AND SAFETY AND THE POWERS AND DUTIES OF BOARDS OF HEALTH.—By H. Leroy Parker, of the Buffalo bar, formerly President of the State Board of Health of Michigan, and Robert H. Worthington, of the New York city bar. 8vo., pp. 513. Handsomely bound in full sheep. Price, $5.25. Will be sent by mail on receipt of price. Mathew Bender, law bookseller and publisher, Albany, N. Y.

All people are more or less subject to the sway of personal interest, without regard to the public welfare or the welfare of their neighbors, and there is no subject of which they are more regardless than that of health—even of themselves, as well as that of their neighbors and of the public; hence the health authorities, in the exercise of their duty, are ever liable to conflict with the assumed personal rights of individuals and corporations, and to have their acts called in question. To what extent and under what circumstances may the rights of corporations, companies or individuals and their freedom of action be interfered with in the interest of public safety are abiding questions with every sanitary officer; therefore every such officer requires knowledge of national and State laws for the protection of the public health; of municipal health ordinances and regulations; of the organization of national, State, county, city and town boards of health and the regulations governing all such organizations. In this regard the work before us is to America what the third volume of Stephenson and Murphy's "Treatise on Hygiene" is to England — aye, more — for, besides embracing the laws and powers of the country relative to and providing for the protection of the public health and defining the scope of the health authorities, it has a comprehensive index of cases, in the trial of which the laws and powers have been tested and decided. The introductory chapters treat of the police powers of the State. Then follow chapters on municipal corporations; powers, duties and ordinances; boards of health—national, State and local, their powers, duties and responsibilities; nuisances, tolerable and intolerable; sponsors, remedies, indictments and abatements; regulations of business pursuits and professions; slaughterhouses and markets; foods and drinks; fire prevention; buildings and building laws; burial regulations; regulation of railroads.

Hitherto it has been the task of the health officer or his attorney to search a library in questionable cases, even where danger most threatens and the public health is in jeopardy. This work effectually does away with that necessity, insomuch that the health officer who takes it for his guide will rarely, if ever, find himself at a loss for a precedent or embarrassed when prompt action is required in the exercise of his duties. As a whole, it is pre-eminently the best aid to the sanitary officer who would be fully alive to the exercise of his duties hitherto published.

THE PHYSICIAN'S VISITING LIST (Lindsay & Blakiston's) for 1897. Philadelphia: P. Blakiston, Son & Co. The forty-sixth year of this publication attests its well-earned repute of being admirably adapted to the most essential conditions. It contains posological and thermometric tables; a chapter on asphyxia and apnea. Monthly record pages; obstetrical engagements; birth and death records, and cash account. Different sizes. 25, 50, 75 and 100 patients daily. $1.00, $1.25, $2.00, and $2.25, respectively.

ROENTGEN RAYS AND PHENOMENA OF THE ANODE AND CATHODE. Principles, Applications and Theories. For Students, Teachers, Physicians, Photographers, Electricians and others. By Edward P. Thompson, M. E., E. E., Mem. Amer. Inst. Elec. Engineers, Amer. Soc'y Mech. Engineers, author Inventing as a Science and an Art. Assisted by Louis M. Pignolet, N. D. C. Hodges, and Ludwig Gutman, E. E. With a Chapter on Generalizations, Arguments, Theories, Kindred Radiations and Phenomena, by Professor Wm. A. Anthony, formerly of Cornell University, Past Pres. American Inst. Electrical Engineers. 8vo., pp. 208. Illustrated. Price $1.50. New York: D. Van Nostrand Co.

A particularly timely and useful work on one of the most useful discoveries of the age. It embraces a history of the discovery with a succinct account of the researches of Spottiswoode, Lichtenberg, Karsten, Hammer, Poggendorf, Gassiot, Plucker, Crookes, Goldstein, Hertz, Lenard, Kowalski, Roentgen, Righi, Varley, Elster, Geitel, Thomson (J. J. and Elihu), Lodge, Swinton, Salvioni. Rowland, Edison, Tesla, Borgmann, Piltchikof, Meslans, Charles Henry, Branly, Stolstow, Pupin, Stine, Dufour, Sylvanus P. Thompson, Terry, Scribner, M'Berty, Rice, Minchin, Appleyard, Buguet, Rood, Mayer, Murray Lafay, McKay, Perrin, Thomson (Lord Kelvin), and many other eminent physicists and electricians.

The work is alike interesting to the amateur or general scientific reader, the medical practitioner, and the electrician. The properties, principles, laws, theories and manner of application of the cathode and X rays are succinctly explained and described under chapters on anode and cathode phenomena in open air, compressed gases, and low vacua; action of the magnet upon the cathode and anode columns of light, and other kindred occurrences in the discharge tube; electric images, electrographs, anode and cathode dust pictures, photo-electric pictures and portraits, bas-relief *facsimiles* and other curious pictures based upon discharge of current anode radiations, motions, effects, striae, velocity and kindred occurrences, such as heat striae and sensitive state; cathode rays in high vacua, inside of discharge tube; cathode rays outside of discharge tube; Roentgen rays, properties, laws, and principles of; applications; instructions on electrical apparatus for generation; construction of discharge tube; difficulties experienced and how overcome; miscellaneous phenomena; Roentgen rays in diagnosis; generalizations, theories and kindred radiations, with lucid diagrams and plates. Students who have passed through a text book of physics or electricity, or who are engaged in such studies, would be benefitted by a course in the discharge tube phenomena, lucidly described in this book.

THE NON-HEREDITY OF INEBRIETY.—By Leslie E. Keeley, M. D. LL. D. 12mo., pp. 359. Chicago: Scott, Foresman & Co.

This book is the outcome of an evident effort of the author to justify specificity—and particularly his own specific—in the treatment of (inebriety) disease. To do this he has found it necessary to consider inebriety a disease and to coin a new classification of diseases into two great families: Diseases caused by germs and diseases caused by poisons. In this way, considering alcohol a poison, he finds no difficulty in illustrating his purpose. But he takes a very roundabout way in getting at it, manifests considerable inconsistency with accepted physiological and pathological truths, and other inconsistencies. Though he would greatly comfort sanitarians—if they were in agreement with him in regard to the good time a-coming—for he says: "It was undoubtedly the intention of the Final design that some day all disease should disappear. * * * But for the microbe there is no good reason why the average duration of life should not be extended to several hundred years. I regard the chief cause of drunkenness, or the unusual use of alcohol, to be due to the poisoning caused by the

germ of disease and the unsanitary public putrefaction of dead organic matter. But it is clear that we are on the eve of discoveries which will cure diseases. A cure will be found in the discovery of some single remedy which will destroy the microbe, whether out of the body or on its surface, or within. * * * If disease has a single cause, which is a living organism, a single remedy must be found which will destroy the cause of disease."

And the inquiry is forced upon us: "What then?" Nothing but inebriety remains, and unfortunately alcohol is not a microbe. "When a nation proceeds to drink poison the law of natural selection proceeds by its own method to rescue from the gutter a class of moderate drinkers. The operation of the law is as follows: Generation after generation are inebriates, because drinking causes inebriety. But as drinking proceeds and the generations are born, nature creates a tolerance to the poison. In time there will arrive a generation who can drink alcohol moderately without causing drunkenness or a craving, because heredity has transmitted to them a certain degree of tolerance to the poison of alcohol. The vice of drinking causes inebriety and inebriety is a disease, for the reason that it is caused by poison." The *vice* of drinking (which is but another name for drunkenness) the author admits to be hereditary, but "when one has been drunk three or four times," its nature is changed, the individual has contracted inebriety—a disease amenable to "my remedies."

It is on such fallacious reasoning that the author proceeds to distinguish inebriety with, and without, pathological lesions—the latter being the kind he pretends to cure. It "is a variation of the tissue cells—notably, of the cerrebro-spinal system; which change in the type of the cell, though microscopically and macroscopically unknown, is now fully verified by deduction to exist."

As a bare proposition, we agree with the title of the book—in the non-heredity of inebriety. But it gains no support by reasoning from such false premises. Yet, upon these unknown and apparently unknowable mere fancied pathological conditions, between wind and water—when drunkenness has ceased to be a vice and before it has developed any pathological lesion—the author bases his claim to an antidote. "My remedies," he says, "antagonize this effect of alcohol upon the nerve cells and break up the rhythmnal automatic craving for liquor. * * * The remedies do not cure the associated diseases of inebriety. * * * I claim to destroy only the craving for drink."

PROCEEDINGS OF THE PURDUE SOCIETY OF CIVIL ENGINEERS.—Stanley Coulter, A. M., Ph. D., Secretary. Purdue University, Lafayette, Ind.

This is a pamphlet of ninety pages, containing six papers: "A Railway Bridge and Building Department," By Onsrard Bates; "Business Wisdom and Responsibility of the Engineer," by W. F. Goodhue; "Landscape Engineering in Connection with the Engineer's General Practice," by W. K. Eldredge; "Fire-Proofing as a Specialty," by Joseph K. Freitag; "Irrigation Works of the Pecos Valley," by Ellwood Mead, and "The Engineer; His Work and Character," by the Rev. C. B. Wilcox.

"ANAESTHESIA."—A photo-gravure memorial of the fiftieth anniversary of the first public use of anaesthesia for a surgical operation. The picture idealizes in a beautiful and impressive manner what might have been an actual occurrence in 1846, when Morton first discovered the possibilities of etherization, and developed that discovery which revolutionized the practice of surgery throughout the world. The picture is printed from a steel plate by the usual photogravure methods, reproducing exactly the work of the artist, and is an exceedingly decorative rendering of an idea suggested by Morton's great discovery. Wm. Wood & Co., New York.

CONTEMPORARY LITERATURE.

DEATHS BY FOOTBALL.—In twenty years of football there have been, so far as I have been able authentically to trace, six deaths, two of them in this last year, directly due to football. Permanent injuries are of very infrequent occurrence, and I have not learned of enough even to start a list. Yet another fact. Every one of these fatal injuries has been received in a game between either teams of immature players or teams at colleges or schools where football was of very recent introduction.

Certainly no one will deny that the hardest games in the country have been played by the Eastern colleges, particularly by Harvard, Yale, Princeton, and Pennsylvania. There has never been a death as the result of football injury at any one of these colleges, and I have never heard of a permanent injury resulting from play between these elevens. The most serious accident, and the only one of its kind I have ever seen, was a crushed breastbone, and the man who suffered that is strong and well to-day.

Do not these facts outweigh the hysterical diatribes continuously launched against football?

When accidents do occur, they are almost invariably magnified by the sensation-mongers of the "new journalism." On the rare occasions of a death, no terms are too dramatic to describe the "horrible brutality" of play which caused it.—*Harper's Weekly.*

GOING SLOW.—It is said that during this century the average of human life has been considerably raised by the decrease of ignorance of hygienic conditions, but when we see how deep this ignorance still is we have small cause to boast. A few educated persons have been able to force sanitary practices upon whole communities, but the mass of the people regard these as interferences with their liberty. We are not astonished at the splendid growth and great age of a tree which has had plenty of moisture in a good soil, but all very old persons are matter of wonder to us. We do not yet study the conditions of a good breed of men half as closely as we do those of a good breed of horses or sheep. It is only a little while ago that we considered a plague that destroyed half the inhabitants of a city as a visitation of God for somebody's misconduct, and diseases as evidences of divine displeasure and chastening, or of satanic possession. We have only recently learned by scientific methods to check epidemics (not yet of mental fads, but of physical disease) and to prevent ravages of pestilences, but we still stand helpless before many diseases which cut down the young and the blooming all around us. We are yet very far from the point of saying that every disease is curable, except those which the subjects of them have incurred by ignorance which led to the destruction of a vital function. We do not expect a tree to live with its roots cut or its bark peeled off. We talk about the diseases incident to old age. There should be no such. They are probably due to early ignorances and perversions. If the race had itself in hand, old age would have no diseases, only the weaknesses proper to a machine running down. And a good machine ought to run down harmoniously. How long man might live if all the conditions were what they might be we cannot guess, but it is evident that few people yet know how to live. And this single fact is a testimony to the very slow progress of the race.—From the "Editor's Study," by CHARLES progress of the race.—From the "Editor's Study," by Charles Dudley Warner, in *Harper's Magazine* for December.

HOUSING REFORM IN NEW YORK CITY.—From a minute study of existing tenement conditions, the company finds that for the

same rentals now paid in slum dwellings it can give from 25 to 30 per cent. more room than is now given, and hygienic housekeeping and moral comforts so vastly improved that it is impossible to make a comparison. Likewise its suburban homes will be available to purchase at a price not greatly, if at all, in excess of ordinary rates of rental for city apartments of even smaller dimensions, the monthly rent payment including an installment on the purchase of a house and a portion of the life insurance premium.

The movement thus outlined seems destined to assume in the early future very large dimensions. The great and constantly increasing population of New York must be housed; and there seems to be no reason why this carefully devised scheme upon the lines of what some one has called "philanthropy and five per cent." should not make successful use of many millions of capital. It will give New York the benefit of the best experience of other cities and countries, and will play a leading part, doubtless, in that complete abolition of slum districts that the progress of civilization must accomplish within the next half-century.—From "New York's Great Movement for Housing Reform," in December *Review of Reviews.*

On Choosing a Profession.—It is not enough to-day to say that this or that boy is absolutely trustworthy in order to get him a situation in a shop, a banking house, or a law office, in the leather or the toy business. He *must* be trustworthy. It is taken for granted that he is honest. This is not undervaluing honesty in the least. Quite the reverse, in fact, because if a boy is not absolutely reliable, nobody wants him, no matter how clever he may be. But there are hosts of honest boys—in fact, almost all of them are straightforward. But to get a place in any establishment much besides honesty and reliability is required, and hence the good old Sunday-school-story type of boy who made millions because—and only because—he was honest, is unfair to the average boy reader, since it makes him think that success is at his hand if he is only honest.—*Harper's Round Table.*

The Increase of Divorce.—Twenty-five or thirty years ago divorces were so rare as to be regarded in the light of very uncommon exceptions to the general rule. The divorce law itself is not yet forty years old in England, nor twenty years old in France. In Italy there is no civil divorce whatever at the present day, and the Catholic Church only grants what are not properly divorces,

but annullations of marriage, in very rare cases, and with the greatest reluctance.

Even in America every one can remember how divorce was spoken of and thought of until very recently. Within a few years it was deemed to be something very like a disgrace, and certainly a profoundly cynical and immoral proceeding. Whatever we may think of it in our hearts, or whatever our religious convictions may be on the subject, it has become so common that when we hear of a flagrant case of cruelty or unfaithfulness, by which a man or woman suffers, the question at once rises to our lips, "Why does she not divorce her husband?" or, "Why does he not divorce his wife?" We have grown used to the idea, and if it does not please us, it certainly does not shock us. It shocked our fathers, but we are perfectly indifferent.

There are various forms of honorable political dreaming and of dishonorable political mischief-making nowadays, which we are accustomed to call collectively "socialism" together. A proverb says that whosoever desires the end, desires also the means. There is more truth in the saying than morality in the point of view it expresses. But there are those who desire neither the means nor the end to which they lead, and a struggle is coming the like of which has not been seen since the beginning of the world, and of which we who are now alive shall not see the termination.—From "A Rose of Yesterday," by Marion Crawford, in the December *Century*.

THE *Home Journal* is the exponent of that literary and art culture which gives grace and refinement to social intercourse—a society journal in the best sense of the term. Out-of-town readers will find the best life of the metropolis reflected in its pages. It is an international journal, and by its foreign correspondence and essays brings its readers *en rapport* with the social life of the great European centres. It is essentially a paper for the *home*, a home journal in the best sense. Morris Phillips & Co., New York.

TOBACCO POISON.—In a book of travels written by a Mr. Barrow we find this interesting bit of information: A Hottentot was seen to apply the short end of his wooden tobacco pipe to the mouth of a snake when the reptile was darting out its tongue. Death was instantaneous, the effect almost like an electric shock; with a convulsive motion that lasted only for a moment the snake half untwisted itself and then became still. And upon examination the muscles were found to be so contracted that the snake felt as hard as if it had been dried in the sun.—*Harper's Round Table.*

SPECIAL MEMORIES IN IDIOTS.—Winslow records the case of a man who remembered the day of burial of every person who had died in the parish for thirty years, and who could repeat with perfect accuracy the names and ages of the deceased and of the mourners at the funeral. He was a profound idiot, and could not reply intelligibly to a single question beyond this nor be trusted even to feed himself.

Morel cites the instance of an idiot who was unable to count twenty, yet could name all the saints of the calendar and the days of their respective *fetes.*

In some of the books on these defectives is mentioned an idiot with a wonderful memory for English history. When supplied with the slightest cue, he recounted in measured tones whole passages of it.

Falret noted an imbecile who could give immediately the days of birth and death and the principal events in the life of any celebrated personage mentioned to him.

Such instances of elaboration of special memories where all other faculties are in abeyance might be multiplied. The cases above mentioned were, no doubt, all of them examples of extraordinary development of the auditory tracts and centers. There are other cases in which the visual memories are disproportionately developed, as in idiots with unusual memory for places or faces. These patients, too, are congenital defectives.—From "Idiots' Savants," by Frederick Peterson, M. D., in *Appleton's Popular Science Monthly* for December.

THE PROBLEM OF LONGEVITY.—As to the question of marriage, the Registrar-General for Scotland published some tables of statistics in 1867 to prove that married men live longer than the unmarried. Scientific critics in England and other countries, however, have questioned the accuracy of these tables, not holding that they were deliberately and of intention false, but that the experiment was not conducted on fair or just principles. These contestants may have been bachelors of centenarian proclivities, and having a reputation to sustain, they would naturally examine a married man's tables with close and scrutinizing suspicion. For, say the opponents of this theory, if a man lives longer by reason of marrying one wife, could not he then double his age or his chances of longevity by marrying two? Perhaps wives are to be taken, however, like those of Henry VIII. of England, only one at a time, though he

had six, and then did not live to be a centenarian. The reasons given by old people for their long length of years are often seemingly absurd. The *Scientific American* of December 16, 1893, had an account of Miss Eliza Work, of Henrietta, N. Y., who was within six weeks of being 100 years old. "The reason I have lived so long is that I have never drank tea nor coffee, and, above all, *never got married*, and I have always been hearty and healthy, too." At the age of 91 she traveled alone to her native place in Vermont. She has always been a hard worker, never had occasion to use glasses and her teeth are of original growth. Her brother lived, she stated, to be 101, and she thought he would have lived much longer if he had never married. He drank tea and coffee, too. People who drink such things, Miss Work thought, and then aggravate the case by getting married, ought not to expect to live long. And yet Miss Work, being herself a centenarian, knows, perhaps, almost as much about the case as physicians.—From "Women as Centenarians," by William Kinnear, in *North American Review* for December.

"THE ENGINEER IN NAVAL WARFARE" is the title of an effective and well considered symposium presented in the opening pages of the *North American Review* for December. It is intended as a reply to the articles published under a like heading in the *Review* for May last. In this instance the contributors are: Rear-Admiral John G. Walker, U. S. N.; Captain A. T. Mahan, U. S. N; Captain R. D. Evans, U. S. N., and Lieutenant S. A. Staunton, U. S. N.

THE CIVILIZING POWER OF IRRIGATION.—The evolutionary process of the last twenty years has brought out some very valuable lessons for the future of California. It has demonstrated that irrigation is essential to the highest standard of civilization. The census of 1890 revealed the fact that two thirds of the gain in rural population stood to the credit of eight counties where irrigation prevailed. The counties which rely upon rainfall had about reached a standstill or scored a loss. The people have always been divided on the question as to whether irrigation is necessary. Those who oppose urge that it breeds malaria and injures the quality of the fruit. Those who favor insist that it is essential to the most scientific agriculture, and to the maintenance of dense population. The last twenty years have answered the question forever. The answer consists of a comparison between the South and the North. The one was born of the irrigation canal; the other of the mining-camp and the wheat ranch. The one is characterized by a high civilization; the other by a low one.—"Our Great Pacific Commonwealth," by William E. Smythe, in the December *Century*.

THE SANITARIAN.

FEBRUARY, 1897.

NUMBER 327.

HYGIENE AND ITS ACCESSORIES.*

By A. JACOBI, M.D., of New York.

Hygiene is that part of medical science and art which treats of the causes and prevention of disease. We cannot conceive of a subject of vaster importance and more incompatible with ignorance. It ought to be understood by every man to whom is entrusted the care of the individual or of the community, for it comprehends, as you will understand if you will but run your eyes over the index of any text-book on that subject, a great many vital topics. To it belong the normal and abnormal conditions of air, water, foods, and soil; the removal of sewage, the construction and sanitation of dwellings, hospitals, schools, manufactories, camps, arsenals and prisons; and the subject of baths and bathing, of clothing and exercise. The theory of disease germs and of contagion and infection, with the history of epidemic diseases and the disposal of the dead, prevention and treatment by antiseptics, disinfectants and deodorizers, and protection by quarantine, and finally, vital statistics form intrinsic constituents of hygiene.

You have noticed that the themes enumerated are, so to speak, no mere primary elements of medical science or art. Indeed, they require the application of a number of branches which must be taught and learned before the difficult matter of hygiene can be fully grasped. It is mainly physics, chemistry, physiology, pathology and bacteriology which form the foundation of the structure, and ought to be thoroughly assimilated by the student's mind before he may expect to master hygiene. It is, therefore, impossible to believe that the undergraduate will in the second or third year of his medical curriculum, succeed in acquiring a knowledge of it any

*Abstract of Address (Albany Medical Annals) at the Dedication of the Bender Hygienic Laboratory, Albany, N. Y., October 27, 1896.

more than he can expect to become a diagnostician without anatomy and physiology, and without patients. The addition of a fourth year to the course of medical study, such as your college has established, is therefore indispensable. To it mostly belongs the instruction in hygiene which, based as it is upon previous studies extending over three years, must be twofold.

Didactic lectures and the study of books will convey much information, but without practical laboratory work neither teacher nor student will succeed any better than the chemist without personal experimentation, the anatomist without dissecting, or the swimmer without water. Now, the significance of hygiene for the physician, the layman and the community at large is such as to preclude the possibility of a college with a two or three years course being able to supply a modern public with modern physicians. Today both the profession and the colleges appear to work for the same ends, namely, the better preparation of matriculants, more years of instruction, longer courses, more branches and more teachers, every one of whom should be a thorough specialist—not necessarily in practice, but in the branch he means to teach—and besides: practical work in laboratories.

When I was a student there was no laboratory anywhere but the chemical. It was at that time that Pettenkofer began in private his influential studies on topics connected with hygiene, but it took decades before he succeeded, in 1878, in obtaining an official laboratory. Still, from him and his time date the appreciation of the theoretical and practical importance of hygiene as a science. I may state the gradual effects of his personal and local efforts right here. It was from that period that the sanitation of Munich became possible. It resulted in the extermination of typhoid fever which had decimated both the home population and the strangers. It spread health and vigor over old and young, while embarrassing the mourning goods stores and the undertakers.

In recalling these historical facts and personal reminiscences, let me not forget, however, that within that time great achievements were accomplished even without the modern methods of work and study. Although there were no laboratories and no high-power microscopes, no Abbe condensers and no oil immersions, there was what no great metropolitan teacher nor obscure country practitioner should be without—educated brains, powers of observation and application and common sense. Within that very time, a century ago, Jenner had introduced vaccination, and one-third of a century

ago the United States improved hospital arrangements. It is our pride as a nation, and always should be, to remember that America has been foremost in accomplishing the greatest practical progress almost without any schooling. I can do no better for you than to copy, in order to make clear what I mean to say, literally from our great pathfinder and master, Rudolph Virchow. In his "Progress of Military Medicine," an oration delivered on August 2nd, 1874, he says: "The French army lost in the Crimean war 33 per cent. of its men, namely 95,615. Of this number 10,240 were killed on the battlefields, and about as many died of their wounds in the hospitals. More than 75,000 men died of infectious diseases. In the American civil war 97,000 died of their wounds and 194,000 perished of infectious and other diseases. What a vast amount of pain and misery! What an ocean of blood and tears, and besides what a number of errors, mistakes and prejudices! It is not necessary to now enumerate the long list of blunders and sins. They are so well know as to serve in the future as warning examples. Let me say here that it was not misfortune alone that showed where the cause of evil was and then provided aid. If the French learned little or nothing in the Crimea, and the Americans so much in their civil war as to create a new era in military medicine, the explanation is not to be sought for in the immensity of misfortune and misery undergone by the Americans, for they did not suffer any more than the French did in the Crimea. The explanation is in the critical and thoroughly scientific spirit, the clear perception, the sound and practical common sense which penetrated gradually every part of the American military administration, and which with the astounding co-operation of the entire nation accomplished more humane results than any great war ever produced before. Whoever studies the copious publications of the medical staff of the American army must again and again be astonished at the vast experience collected in them. Absolute accuracy of details, the most painstaking statistics, acquaintance with all branches of medical learning, and a comprehensive style are united in them for the purpose of collecting and preserving in the interests of the present and future generations the new knowledge so dearly bought."

The practical results of the civil war were the pavilion system, the increase of air space, the isolation of contagious diseases, the improvement of heating and ventilation, and thereby a vast saving of lives. The lessons were not lost; were learned and adopted all over the globe, and made the American name honored and blessed

all over the world. Understand, young men, for the present and the future, that this is the only practical and useful sort of interference with European nations which is worthy of the American people and consistent with the principles of our government.

While almost instinctively we succeeded in finding some way of escape from deadly diseases, the Europeans advanced slowly and surely to the evolvement of what first appeared theoretical science only, but proved of vast practical import. These two, as a rule, go hand in hand. It is true science that has its own reward in satisfying the mind, but I know of no instance in the history of mental development but demonstrates the fact that the most theoretical, the most abstruse intellectual result will always turn out to be serviceable to mankind. Of this there is no more beneficent instance than the methods by which the sources of disease have been fathomed. By the study and knowledge of their causes the greatest improvements have been made in the prevention and treatment of epidemic diseases. There was a time when they were unexplained in their suddenness and considered unavoidable. Niobe and her nine children slain by Apollo and Diana are always sad realities. There have been millions like them, though they alone live forever in marble and prove that the highest degree of aesthetic and artistic achievement may well accompany dense ignorance. That may occur in nations as it does in individuals. In heathen antiquity and Christian mediaevalism disease and death are deemed punishments. There is no way of combatting them; mute submission only is demanded. Nothing is indicated but prayers, offerings of beast or man, and pilgrimages. There was another time when nothing bad could happen except through some evil influence. Somebody was at fault when a cow or a child died. There was witchcraft or the evil eye. When there was a general dying somebody must be killed for it—dissenting protestants by the hundreds, Jews by the ten thousands.

There was a later period when it was neither gods who sent their swift arrows nor Jews who poisoned the wells; when it was well known that epidemics would follow in the path of wars and thus depopulate the large cities; that they would spread from man to man and thus decimate the people. The latter belief was even exaggerated when it was found advisable to class syphilis also among those diseases which could be transmitted without physical contact, for nothing is more pleasing to human self-love than to escape, not so much guilt as the appearance of guilt. Thus it was felt that in

the dissemination of contagious diseases there must be a something the nature of which was unknown or unknowable. The "genius epidemicus," the epidemic tendency, was the pass-word which allowed etiology to go unchallenged. By others, though they admitted not to know the nature of the contagion, the latter was believed to originate in the body, at least in some instances, spontaneously. Typhoid fever, tuberculosis, dysentery were thus explained. By many, spontaneous generation of the cause of the disease was assumed for the generality of cases; by others, for the first instances of the epidemic only, but no matter whether the real cause was hidden there were the facts of contagion and of awful mortality; and the clear head of the eighteenth century—Sydenham in England, Boerhaave in Holland, Van Swieten in Holland and Austria, Peter Frank in Italy and Austria—knew better than to cross their arms in such nihilistic contemplation as reigned supreme through a protracted period of this very century of science and humanitarianism. Many of the measures established at present on solid knowledge and improved by experimental research were inaugurated by them. Their reasoning was as follows: Man is the carrier of contagion; therefore, when falling sick with a contagious disease he must be isolated. A contagium will not cling to everybody indiscriminately. Thus the amount of individual vulnerability appears to be larger or smaller, but no matter how various the degrees, there is *some* vulnerability probably in everybody. Therefore, try to diminish it by saturating the system with the poison when the epidemic is mildest. Thus they inoculated variola and risked a slight danger rather than allow men to die of a greater. And thirdly, no matter whether the nature of the contagion is clearly known, it is advisable to destroy or diminish its poison. As early as the period of black death in the fourteenth century people would keep wood and tar fires burning in the streets. Was it the instinctive belief in the disinfectant action of heat, of tar, and of creasote?

Afterwards fumigations with vinegar, with chlorine, nitrous acid, were resorted to. Patients and utensils had to submit to disinfection as best they could, and goods or tools were either burned or temporarily buried.

The organic origin of disease (which was to be proven after manifold labors) was first suspected in antiquity when imagination gathered all the visible and alleged invisible insects under the sinister command of the supernatural patron, the devil. Amongst

the Romans, Varro suggested the presence, like that of big insects, of invisible minute beings hovering over swamps which he thought might cause fevers. Paracelsus when speaking of the seed of diseases may have believed in a similar hypothesis. A clergyman, the Jesuit Anastasius Kircher, 1671, was the first, however, to claim contagion to be the result of organic influences, and Leuwenhoek being in possession of a better instrument made by himself, was the first to discover real bacteria.

Progress, however, was slow. It took a century until O. F. Müller, 1786, was able to describe and draw some of them. The names given by him are still in use. Bory de St. Vincent in 1824, Ehrenberg in 1838, Dujardin in 1841, added a great deal to our knowledge. In my own time Perty, in 1852, discovered the changes which take place in bacteria when developed under varying circumstances, and in 1853 Ferdinand Cohn classified, rather pedantically, it is true, the whole number of microbes then known.

Kircher's theory of the organic origin of disease was adopted by Lancisi, Reaumur and Linne. Its firmest believers were Marcus Antonius Plenciz, whose book of 1762, and Pringle, whose researches on infectious diseases and disinfectants furnish the best presentation of the subject in the last century. Their views, as Ferdinand Hueppe aptly remarks, were, however, not generally held, because it was not so much the *cause* of the disease as the disease itself that was considered to be a living parasite; for it is from that time that such names date as lupus and cancer, which have outlived their justifiable term of existence. Besides, positive knowledge based on descriptive observation was defective to such an extent that even Malpighi, Morgagni, Bichat, and up to 1874 Virchow, gave their attention exclusively to the pathological anatomy of organs and tissues.

At that time, however, the question of the nature of putrefaction engaged the attention of many minds. Decomposition was proved to be organic in yeast by Astier in 1813, the so-called "bleeding hosts" were demonstrated by Sette in 1816 to owe their discoloration to bacteria. In 1837 Cagniard Latour studied the yeast deposits which he found during alcoholic fermentation. He proved them to be organic, and presumed they were the *cause* of fermentation. In the same year Schwann became more positive of this, and moreover found that extract of nux vomica did not stop fermentation, but that arsenic did. This is why he took it to be of vegetable nature. The same results were obtained by Turpin in

1838. Fuchs in 1841, Remak in the same year, and in 1843 Mitscherlich referred all fermentation to living microbes. The two last named authors were the first to find *two different microbes in two different forms of fermentation.* Helmholtz also participated in these researches without, however, excelling here as he did in almost everything else he undertook. It was only in 1857, however, that Pasteur could prove undeniably, in spite of Hiller's and others' remonstrations, that *all putrefaction and fermentation were attributable to microbes,* and that *each different fermentation had its own specific organic cause.*

Long before researches on the origin of the diseases of animals, Provost found in 1807, and deBary after him, the causes of diseases of plants to be microbic. Bassi and Balsamo discovered in 1835 the microbe of the "muscadine" disease of the silkworm, and Audouin the spores which enable the parasite to live through the winter. Schoenlein found the achorion to be the cause of tinea, Simon the acarus of the itch. It was shortly after this time that Henle, in 1840, formulated his conviction that infectious and contagious diseases were the result of living causes. His main reasons were these, that in such cases the morbid matter was evidently increasing from the moment of invasion. Organisms only have that faculty. Another reason was this, that the quantity of the invading material was out of proportion to the effects gradually obtained by it. Further, that there was a stage of incubation which was not required in poisoning by a definite dose of a simple chemical substance, and lastly, that the poison, which is introduced in a very small quantity, must increase before the disease can be expected to make its appearance.

Henle's theory, suggested by the facts hitherto known and supported by the published reports of Franze Schulze in 1836, and Schwann in 1837, was confirmed by Schroeder and von Dusch, 1854 and 1861, by von der Broek, 1857, and by Pasteur. Pasteur having established as a sound fact the principle, *omne vivum ex vivo*—that is, nothing that is alive can possibly have come from what is dead,—and thereby annihilated the doctrine of spontaneous generation, and having further found that fermentation and putrefaction took place through external microbic influences only, Joseph Lister concluded that if wounds became infected through such living external influences only, the latter should be kept away from them before they could reach them, or be destroyed. That was in 1867.

There was great activity in the study of bacteria from 1866 to 1880. Klebs found microbes in pneumonia in 1866, Rindfleisch septicaemia in 1856; soon after that Lingmansen and Waldeyer in metastatic abscesses. Klebs in suppurating wounds in 1872, others found them in septicaemia, erysipelas, hospital gangrene, puerpal fever, diphtheria, and finally Obermeier in relapsing fever. In this way much valuable material was collected, but unfortunately but little sifted. It was supposed that in similar conditions many varieties were found to occur simultaneously, by several in abscesses, also in diphtheria, in cholera, in variola. Pasteur found a number of bacteria in putrid material, but in most cases no positive decision was at that time arrived at as to the relationship of specific microbes to specific diseases. Besides, there was never such a scramble for notoriety as in those times. Dilettanti in journalism were as numerous as prospectors at a fair or tramps after a battle. The medical journals and monthlies of that time teemed with new discoveries and new bacteria. Bacteria found in the dead body were pronounced to be the cause of death, accidental finds the origin of a certain disease, and hundreds of essays appeared at that time which owed their origin to carelessness in experiment or observation. This could happen that even all the results obtained by one of the most acute and ingenious experimenters, Hallier, could be proven by Billroth to be worthless, because no protection had been provided against the accidental admixture of miscellaneous bacteria. At that time it took a great deal of mental equilibrium not to be swamped by the flood of new microbes. Indeed, in spite of the results already attained and appreciated, the profusion of immature publications was enough to create doubts and prejudices in the minds of many clinicians. It was at that time, in 1880, when finishing my treatise on diphtheria that I availed myself of that occasion to express my own feelings about the hasty and immature conclusions arrived at by the crowd of microscopic fiends and leaned in the explanation of the diphtheritic process rather to a chemical poison than to the direct influence of a parasite. Riper experience, all built up on laboratory work, has since taught us that in diphtheria as well as, with but few exceptions, in every infectious disease in whose development microbes seem to be concerned, it is a chemical product of the [illegible] which penetrates into the circulation and destroys [illegible] te indeed that it should be so, for chemical poi- [illegible]ly counteracted than living microbes circulating

in the blood. The latter condition is present in anthrax. That is why Pasteur's inoculation of thousands of flocks of sheep with less virulent anthrax has not proved an unmitigated success. Deaths have taken place after such inoculations as they did when in the last century smallpox was inoculated to protect against smallpox. In southern Russia in such attempts at conveying protection thousands of sheep were destroyed. When speaking of this accident it was Haffkin, of whom I shall have more to say, who, shuddering, exclaimed, "If that happened to man!"

After many mistakes, amongst which one of the most prominent is the alleged isolation of Bergmann's "sepsin," Panum proved that *septic poisons could be derived from microbes,* after Coze and Feltz in 1866, and Burdon Sanderson, and in 1872 Davaine had succeeded in perpetuating infectious processes by persistent inoculations of the same microbes from animal to animal. As early as 1868 glanders had been produced by vaccinating its pus, and it was proved by the effects of immense dilution that the infecting material must necessarily be of organic nature. Still, the nature and manner of propagation of the microbe was not recognized. Finally in 1876 Koch discovered that the great vitality of the bacilli of anthrax, themselves very perishable, owed their vitality to the formation of spores.

Thus far the parasitic theory appeared to be rather firmly established, but still, as many believed in the excessive variability of bacteria, and attributed their many different forms to transmutation of a single original form, they were often believed to be not the *cause* but the *accompaniment* of the infectious process. All this happened in spite of the fact that Pasteur had differentiated the bacteria of wine and of beer fermentation, of anthrax, of sarcina, of amylobacter, and Obermeyer's specific spirilum of relapsing fever was known since he paid his self-sacrificing zeal with his own life. Another proof of the essential differences of bacteria was accidentally found by Schroeter, who noticed differences in the color of his cultures, but a scientific differentiation became possible only when C. Weigert, and later on Ehrich, taught the systematic staining of bacteria by means of basic anilin dyes. With this method and better microscopes, and immersions, and the use of Abbe's condenser, Koch made rapid strides. In 1877 he published his treatise on the methods of research, and in 1878 the etiology of the infection of wounds. About the same time Pasteur, 1877, after having proved in 1863 that normal blood was free of germs, dem-

onstrated that the bacillus of anthrax would grow not only in the circulating blood, but also in blood outside the body and on other nutrients. Thus prepared, he and his pupils discovered a number of characteristic microbes; that of malignant oedema in 1877, the staphylococcus pyogenes in 1878, that of the sputum-septicaemia, identical with the pneumococcus of Fraenkel, in 1880, of chicken cholera in 1889, of hog cholera in 1882. Lister, Buchner, and Koch further improved the methods of examination until in 1882 the latter succeeded in demonstrating his bacillus of tuberculosis before the physiological society of Berlin. At this time it was conclusively proven that the microbes had each their peculiar etiological significance, that in fact it was a *single specific microbe which caused a single specific infection or contagious disease.*

Let me here try to correct what I believe to be a mistake and to give rise to confusion. The terms contagion and infection are too often used promiscuously, though they are by no means synonymous. The dissemination of mycotic diseases takes place in different ways. There are those which cannot be communicated from person to person, but spread only by the microbic cause invading the individual. To this class belong malarial fevers produced by plasmodia. Malaria is not contagious; just so in all probability cerebro-spinal meningitis. There are, secondly, those which are not communicable from person to person, but through external carriers only, such as soil, water, food, air, clothing and utensils. To that class belong yellow fever and Asiatic cholera. They are infectious. There are, finally, those which may be transmitted directly from a person, or indirectly through carriers. To this class belong scarlet fever, measles diphtheria, variola, influenza, erysipelas and varicella, perhaps also whooping cough. They are contagious and infectious. As its cause has not been sufficiently proven to be microbic, I do not add syphilis. On no account, therefore, ought the terms contagion and infection to be taken as synonymous.

The belief of Naegeli that the multiplicity of bacteria originated in a single or a few changeable varieties was proven to be erróneous partly by direct observation and partly by the results of cultures undertaken under varying circumstances. It can be demonstrated that the infectiousness of bacteria may be increased or lowered. That is what Buchner found in 1880 in regard to the bacillus of anthrax. The main progress in the following years was made by Pasteur either single-handed or in co-operation with his

pupils. In 1880 he found accidentally that the bacillus of chicken cholera was less virulent when the cultures were exposed to air and got cool. Still, the hens infected with them became ill. After they recovered he infected them with thoroughly virulent germs, and, lo and behold! they were immune. From *that time dates all our modern protective and curative therapeutics of infectious diseases.* Pasteur then experimented with anthrax. A few of his results can be stated in the following brief sentences: The bacillus of anthrax did not develop in the blood of the living chicken. That is, the latter were immune against anthrax. But the bacilli *did* develop in the blood of chickens outside their bodies. The conclusion was that the presence of bacilli in the animal body was active or inactive, not *through its own properties, but only so far as the animal tissues permit of its influence.* The disease, therefore, is not established by the presence of the bacillus, but is the composite of the symptoms caused by the battle of the invader with the living cell.

Pasteur also found that the infected chick remained immune when retaining its own high temperature. When it was cooled by being immersed in water it fell sick, but recovered when again warmed. The conclusion is that the development and growth and injuriousness of bacilli, or some of them, depend on the *temperature of the medium* in which they are. He further found that the bacillus of anthrax grew in sterile urine when being alone in the fluid, but not when other bacilli were exposed together with it. This observation was confirmed by further experiments. When these bacilli were injected with other bacilli into an animal, the bacilli of anthrax did not thrive, and the animal remained well and alive. The discoveries followed one another in quick succession. Septic phlegmonous suppurative processes of all kinds were found to be caused by different bacilli. On the other hand, the same *microbe would cause different affections in different animals.* The bacillus of chicken cholera, for instance, produced general sepsis in the chicken, but a local abscess only in the guinea pig.

The virulence of the bacillus or its poison can be lowered in many ways; by high temperatures, partial dessication, dilution by chemicals, or by culture of the original in different animals. Pasteur's experiments with the bacillus of anthrax were very numerous and efficacious. He produced cultures of lowered infectiousness and vaccinated sheep. It is true many died of the infection, but a great many were rendered immune, and the mortality from anthrax was very much reduced. Experiments made with the view

of lowering the virulence of bacilli in other animals were also successful. That of hog erysipelas was thus changed when passing through the rabbit, and the poison of rabies, believed by Pasteur—though even he could not isolate it—to be the product of an organism, after unsatisfactory experiments with monkeys, was weakened by its passage through the same animal, viz., the rabbit. The indomitable man was successively engaged in finding new hypotheses based on well-known facts, and in experiments which were to prove or disprove the value of his hypotheses. In regard to rabies his reasoning was as follows: The long duration of its incubation proves the slow progress of the poison in the direction of the nerve centres, for it is of symptoms of the nerve centres that the patient infected by a mad dog finally dies. Thus the time between the infection and the affection of the nerve centre should be utilized by antitoxic injections. The poison must be intercepted. It is well known that the spinal cord of the rabbit is gradually and in proportion to the duration of its presence in the organ, changed by injection with fully virulent rabic poison; that the different degrees of morbid changes produced in its tissue yield a material which is employed for injection into the patient who has been, or is believed to have been, infected. The attacks on this method, or rather its effects, are many, but it appears that the good done by it far outweighs its dangers or ill results. And one fact must never be forgotten: it is but little more than a decade since the method has first been employed. It has been the forerunner of other discoveries of similar import and of more and extensive utility. Thus it appears that the future therapy of infectious and contagious diseases will be built upon the foundation laid by the work performed in Pasteur's and other laboratories.

As far as Asiatic cholera is concerned, the discovery of the comma bacillus appears to have finally settled the question of its cause. The bacillus, however, does not enter the circulation, but destroys life by secreting a deadly poison. So does that of yellow fever; so does rabies, each with its own poison bred by its own specific bacillus. In these diseases it is not the weakened bacillus that can be expected to act as an antidote, but the lowered strength of the chemical poison. Thus it was that Ferran's therapeutical experiments with living cultures in 1885 were of doubtful importance. When cholera again appeared, in 1890, Haffkin of Russia, working in Pasteur's laboratory, found that cholera bacilli when cultured lose part of their activity. Imbued as he was with Pasteur's prin-

ciples, the light flashed upon him. The lowered activity of the cultured bacilli could be expected to be utilized as the healing agent after having been tried on somebody. But animals are immune, so he made himself the object of experiment, and he did not die. Within two years afterwards, in the East Indies, he made 70,000 injections on 42,179 human beings in 98 different localities. No accident marred his operations, though pain followed each of them for four or five days. In order to control his experiments he always vaccinated a part of the population only. What were the results of his laborious and self-sacrificing labors? In Calcutta the morbidity of those vaccinated fell to 1-19 or 1-24 compared with former experience; the mortality fell to 1-17 or 1-24. If in the near future—in Berlin they are experimenting at this moment on the action of dead cultures which appear to immunize—the methods will be improved, and the East Indian and Arabian pilgrims be vaccinated before they start for Mecca, "Death, where is thy sting? Grave, where is thy victory?"

As so much has been written on the subject of diphtheria, a few words may suffice on that form of this contagious and infectious disease, which is caused by—or, as some still say, accompanied with—the Klebs-Loeffler bacillus. The bacillus locates on the mucous membrane of the naso-pharynx, sometimes on wounds. On the mucous membrane it produces a disease only when the surface is sore and thereby amenable to invasion. It does not enter the circulation, but produces a poison which is rapidly absorbed. When this chemical poison is injected into an animal in slowly increasing doses, which should be large enough to make sick but not to destroy, an antidote to the original disease is produced in the serum of that animal. This is the healing serum of Behring, which has succeeded in greatly reducing the mortality of diphtheria, and may be further proved to cause temporary immunity when injected into those who are well but constantly exposed. This almost fabulous result is the result exclusively of laboratory work. The success accomplished thus far speaks well for the future. It does not require an unbounded enthusiasm to believe that the results will be still more favorable in this dread disease, which destroys the infants and children in every country by the ten thousands, and to trust that further study and experimental labors may find similar methods for the subjugation of other contagious and infectious diseases. The question of rabbit, sheep, or horse rights ought not to be raised. We kill them and eat them to keep alive.

In the laboratory we utilize them for the purpose of finding means to keep alive our people, young and old, while but few if any are destroyed in the process. The problem will be to decide whether the future is to belong to the rabbit and sheep or to mankind.

All those results could not have been attained without experimentation on animals. The saving of animal and of human lives accomplished by its teaching is simply immense. Let us consider.

The investigation of the action of remedies cannot be complete without it. Anthrax has lost its terrors amongst the French peasantry since Pasteur discovered how to reduce the mortality of their sheep. One of the most fearful calamities of former times, the terror of every woman who is to become a mother—childbed fever—has been reduced to the very lowest figure wherever the teaching of animal experimentation has been heeded. Hydrophobia, fatal in every case, is now accessible to successful treatment. Myxoedema, an incurable disease a few years ago, has become curable in almost all instances, even cretinism in many. Tuberculosis may be, and is in part, confined within certain limits. The prevention of cholera is no longer a dream. The mortality of diphtheria has been reduced to one-half of what it was. The success of surgical operations under the influence of Listerism is simply marvellous; antisepsis and asepsis have been evolved out of the laborious studies of medical experts.

All these blessings, the enumeration of which has not exhausted the list, are the immediate results of experimentation on animals. To deny it is either ignorance or malevolence—mostly the former. In our times when nobody who is mortal can be acquainted with everything worth knowing, it is no reproach to be ignorant of topics known only to those who make them their special study. There is, however, another class of people with whom there is no reasoning. As long as the law of the land allows them to be abroad, you can only rely on the better judgment of the majority.

You say that hundreds of M.D.'s add their signatures to the applications for the abolition of animal experimentation. Still, you do not say that you know how easy it is to gather names, such as they are, on every sheet of paper which is not a check or a promise to pay. Unfortunately it is too easy; and if the public does not know, we in the profession know that there are M. D.'s and M. D.'s. There are those who make a living out of their profession—a trade out of a vocation—without ever having the clouds removed from their brains, or from their hearts, or from their consciences

either, by solid knowledge of any kind, or by sympathy or the sense of responsibility. Do you expect that the hundred thousand practitioners—not every M. D. is a physician—of the United States are of equal knowledge, morality, public spirit and self-sacrifice? In other spheres you do not count names, you weigh them. When you require an exalted opinion based on the laws of the land or of humanity, you select an expert. In great economic and political questions you ask statesmen, but not the wire-pulling ward politician. And in a question of science, of physiology and hygiene, you want us to believe that you abide by the name of any M. D. in some distant corner whose name you have never heard, never will hear! But there is a famous man on the other side of the Atlantic. Famous! Yes, for did he not cut more abdomens than any living man? He is an apostle of antivivisectionism! I do not stand here, however, to criticise methods of operating or of making out statistics. What I always do when I want to take the measure of a medical man is to consult the opinion of the best men in science and in morals of his country. His weight is taken.

Who believes, or makes believe, that there is no sympathy, love for the living, or regard for life in those whose profession is more than any other an arduous labor of love? Or who, not a medical man, will decide what means must be selected to increase knowledge, and as every knowledge has its practical results, to benefit mankind? Is there any antivivisectionist who would not on principle employ antitoxin if his child be stricken with diphtheria? Or a woman who would refuse preventive measures due to animal experimentation exclusively, in order to avoid her own death or that of the newly born waif? It is no use to call antivivisectionists hard names. There is but one thing to do, namely, to appeal to their common sense, their duty to husband, wife, children. *Thus* it *has* come to pass that the English restrictive laws have been partly rescinded, and English medicine is thereby restored to the privileges of legitimate science. No prohibition of any kind ever worked well.

One of the objections to animal experimentation which we hear constantly from the lips of antivivisectionists is that the results of such procedures are unsatisfactory in as much as the struggles and the pain render the conclusions unequal and doubtful. That may be true to a certain extent, but as I have proved by facts, is not a barrier to the extension of our knowledge. To a certain extent it *is* true, however, and some experiments cannot be made without

giving pain. But the light of science shines on animal as it does on man. Anaesthesia, which itself has not been developed without animal experimentation—and is it not a wondrous achievement?—has been a blessing to both man and animal. Under its influence there is no pain, no struggling, and less uncertainty as to the results of observation. Thus more humanity and more reliability go hand in hand. Nobody rejoices more intensely at that than the experimenter, for he can observe better, study better, and he need not himself suffer by giving pain to the helpless. Medical science and art were born out of the heart of man. The physical distress of man created love and helpfulness. It is not in the nature of things that the followers and apostles of medicine should be otherwise than thoughtful and sympathizing. This much I, who have been a close observer and a co-worker of the medical profession of the State of New York these forty-three years, can say that I never knew of a medical man, practitioner or teacher, who was morally lowered by his practice or his scientific work. On the contrary, I find the old practitioner getting more cautious and sympathetic, and the pure scientist more considerate and circumspect from year to year. We are not angels, nor pretend to be in this life; but we do not forget, any more than any other heedful member of human and humane society, that "Though I speak with the tongues of men and of angels, and have not charity, I am become as sounding brass or a tinkling cymbal. And though I have the gift of prophesy and understand all mysteries, and all knowledge, and though I have all faith so that I can remove mountains, and have not charity, I am nothing."

It is to me a constant source of painful surprise to find men and women ever ready to attribute bad, selfish and cruel motives to others. Do they think the great experimenters had an easy life? If there is an occupation that strains every physical, moral and intellectual labor, it is that of the close student of nature. Nor is the study of nature unattended with danger. When a soldier dies in the very moment that he is bent upon inflicting death upon his adversary he may be rewarded with admiring songs and a lasting monument. Every physician, every scientist is constantly on his field of battle, and he may die on it. Obermeier was not the only one who, when studying the spirillum of relapsing fever by night and day sacrificed his life. For him there is no visible monument. Only a few months ago the magazines reported the death of a young experimenter who was killed by his object of study.

Nor is the story I heard Dr. Playfair tell a few days ago on the occasion of the Boston semi-centennial celebration of anaesthesia less.

The interests of human and humane science are amply guarded by some such restrictions as will confine animal experimentation to institutions specially calculated for such purposes. To them it may be confined. In them, however, it *should be protected.* And instead of being hampered by the intrusion of uninformed and jealous watchmen, as has been proposed, it should be treated with admiration and reverence. What the church and sanctuary are to the religious, what the hall of a library is to the student of history and science, that is the laboratory to the explorer of the mysteries of life, and to the teacher of those secrets the revelation of which is indispensable for the protection of mankind, and the enhancement of its felicity.

The Bender Laboratory of Hygiene as planned and established will have two objects, at least for the nearest future. I understand it is meant to be the place where systematic efforts will be made to increase, by new and original research, the stock of such knowledge as will prevent, wherever it will reach, the origin and dissemination of contagious and infectious diseases. Its further destination in connection with the Medical College and its hospitals is to furnish the means of an exact diagnosis of the cases entrusted to the painstaking care of the hospital physicians. From the standpoint of philosophy and humanity these two ends, it is true, belong together. The first is to benefit all humanity. The second includes the scientific labors calculated for the individual sick. It seems to me, however, that you will soon learn that the interests of science as a whole and those of the patients in your wards can be better served by separating them. Indeed, the laboratory of hygiene ought to labor exclusively in the service of the scientific and social community; the hospital in that of the individual man, woman, and child. Laboratories like this new abode of science are but a few dozen years old. Within that short period many of the aspects and aims, not only of theory, but of practice have been changed. A modern hospital is as different from that but twenty-five years old as a comfortable, clean, ventilated, spacious, cozy and healthy house of yours differs from the lodge of the pioneer. He lived in it, but its barrenness and exposure are not the consummation of human civilization and cultured existence. Modern science means to make hospitals modern institutions and succeeds in so doing.

Whatever contributes to the comfort and welfare of the patient—ample space, light and food, all the resources of science—society places at the disposal of its wards. In this way hospitals have become a school, not only for the medical man, but for the public also, There is particularly one demand which ought to be fulfilled in every hospital.

There ought to be, there must be laboratory facilities in and directly connected with every modern hospital. It requires no demonstration that rational treatment is not possible without a correct and minute diagnosis. Blood, sputum, urine, faeces, stomach contents, tumors, eruptions, require a careful examination. There is scarcely a case nowadays that does not require some one examination of the kind. Nor is it enough in blood diseases, for instance, to count cells, compare red cells and leucocytes. These very leucocytes assume different characters and undergo the most various changes. The indistinct class of fevers which tempt so much to call them malaria, perhaps because the mellifluous and foreign sounding word is relished by the people, require for diagnosis examination for plasmodium, or the bacterium coli commune or streptococcus. The cases in which neither was found, but an encephalitis explained all the symptoms, are not rare within my own experience.

The examination for tubercle bacilli facilitates the diagnosis of the true nature of peritonitis which may depend on appendicitis, tuberculosis, carcinoma, or the invasion of the bacterium coli commune, pneumococcus, or streptococcus. The very diarrhoea of the child is far from being always catarrhal or the reflex of external exposure and irritation. It is mostly the result of the bacterium lactogenes, or coli commune, or hay bacillus. The very selection of the milk food is a matter of grave responsibility which often can be shouldered only by a person equipped for microscopical and bacteriological examination. The latter is by no means so simple as it was thought to be when knowledge was less and faith greater. It is not more than a dozen years ago that a gentleman who admired his universal standing as a microscopist told me that he disdained the use of stains, for what he could not see without dyeing and understand, did not exist. Now he is staining.

The labor connected with every single hospital case has greatly increased with the accumulation of new knowledge. Even a layman uninstructed in medical matters, appreciates that difficulties grow with results, results with difficulties. So the best achieve-

ments of a hospital require from year to year more facilities, because they demand more work. Without the former, the latter remains sterile. The faithful blending of practical labor and scientific research finds no better illustration than a thoroughly modern hospital with a clinical laboratory attached. What I mean to suggest, in your case, is that in no distant future the hospital work ought to be performed not only in the sick wards, but also in a clinical laboratory immediately connected with them. All scientific work, however, unconnected with a special case, unless its interest and importance be of unusual magnitude, ought to be delegated to this new institution.

The necessity of equipping a hospital with all that is required by the laws of hygiene and the demands of scientific diagnosis concerns not alone the individual patient or the attending physician. It reaches further. By facilitating research, it adds to common knowledge and improves the chances of not only the patient, but of the future patients and doctors. Indeed, every such hospital is a school for the medical profession at large and at the same time a benefit to the community.

INSUSCEPTIBILITY TO VACCINATION, A VERY RARE OR NON-EXISTANT CONDITION.—In the last report of the medical officer of the Local Government Board it was stated that among 88,875 successive vaccinations by the officers of the board, whether with humanized lymph or with calf lymph, no case of insusceptibility had been met with; that is to say, in no case of primary vaccination had the individual been vaccinated three times unsuccessfully. The statement has caused some expressions of astonishment, especially as it was accompanied by another to the effect that no less than 1,983 certificates of insusceptibility had been granted by medical practitioners in England and Wales during the last year reported on. There is, therefore, some interest in noting what has been the result at other than public Government stations, where, presumably, the operation has been performed with perfectly fresh—that is, unstored —lymph. We now note that Mr. O. Lowsley, public vaccinator for Reading, recently announced to the Reading Board of Guardians that out of 14,000 children whom he had vaccinated he had "never found a case of insusceptibility." Although "insusceptibility" to vaccination is admitted by law it really becomes doubtful whether it has more than a legalized existence.—London *Lancet*, November 14.

THE NATIONAL MUSEUM OF HYGIENE.

At the foot of Twenty-third street in the city of Washington, there is an old building amidst a fine grove of trees, overlooking the Potomac River, over the door of which raised letters tell that it was erected in 1842, during the administration of President John Tyler. Upon inquiring within the visitor learned that for many years Uncle Sam here had his wise men, who explored the heavens with great and small instruments, seeking knowledge of the spheres, gauging the flight of time, and otherwise garnering the secrets of earth and skies for the benefit of mankind in general, and especially for those who go down to the sea in great ships. It was the U. S. Naval Observatory—removed a few years ago to Georgetown Heights—but recently transformed into the Museum of Hygiene. The old structure has lost its telescopic communication with the heavens, and now comprehends the paraphernalia requisite to the study of humanity, from incipiency to dust.

The Museum is a veritable curiosity shop; and a more suggestive place could not easily be found. Here one is reminded of comfort and hardship, sickness and health, life and death. The progress of hygienic science on land and water is well illustrated, showing all manner of sanitary apparatus, models of hospitals, hospital ships, and the various ways of disposing of the dead; besides presenting interesting object-lessons on food, drugs and other things for the welfare of the genus homo.

With Dr. S. H. Griffith of the Museum, who kindly pointed out and explained many interesting features of the place, the writer proceeded on a voyage of discovery through its halls and rooms. There is a vast difference between the internal arrangements, as well as the surroundings of the old Museum and the present commodious quarters and display. To the comforts of heat, light and space, all of which were deficient in the old building, but now adequately provided, are added those of convenience of arrangement and general attractiveness. The reception room and office are in keeping with the new order of things, and the library room is all that a student can desire for the material at hand. It is forty feet in diameter, of circular form, and is well lighted. The ceiling is in

charming stamped pattern and the oaken parquetry floor shines like the deck of a man-of-war. It is, altogether, a place well calculated to impress the mind and excite concentrated study of some one or more of the many objects in view, all more or less related to human welfare—whether it be the diseased joint of a drain pipe, the unhealthy appearance of bottled disease germs or a morbid specimen of human anatomy. As aids to such study there are about 1,000 bound volumes and 8,000 pamphlets at hand, and a laboratory apparatus in admirable running order.

Just outside of the library, in the southern exhibit hall, one is reminded that while the Museum concerns hygiene generally, it has much to do with ships. Here quarters and berth arrangements for the sick on shipboard are shown in models representing several methods. They are all commendable, as far as they go; but they do not go far enough. There should be seen in this exhibit the work of some inventive genius in shape of a perfect hospital ship—one equipped with all modern conveniences in addition to the best medical and surgical means—as an example for those who construct, as well as for those who use them. The present sick-bays of war ships are altogether inadequate to the exigencies of battle; and berth-decks or other makeshifts could in no manner meet requirements as could properly constructed, special hospital ships. These would indeed be floating homes of refuge, recognized by all nations as sacred to the unfortunate. It is to be hoped the Ship of State will take this idea in tow.

In another portion of the building there is a ship disinfecting apparatus, by the use of which long detention at Quarantine is made unnecessary; for with it purification is rapidly accomplished in the various parts of the vessel; while all germs contained in clothing, bedding, etc., of passengers and crew, are destroyed by a separate process. In the latter work the possibly infected material is subjected to extreme degrees of heat in closed cylinders, in which are movable carriers, mounted upon a wheel track used for running material in and out. In fumigating a vessel, with the apparatus mentioned, two sulphur furnaces are used—one on a tugboat which lies along side, and the other located on the wharf and mounted upon a track, so that it can be wheeled opposite any part of the ship. Each furnace is provided with a rotary suction blower driven by a steam engine and connected with the hold of the vessel by galvanized iron pipes. The air is drawn from the hold through one pipe, forced over large pans of burning sulphur, and then

driven back, through another duct, into the hold, purified by heat and mixed with *sulphur dioxide.*

It may be upon the principle of "the eternal fitness of things" (?), that the Museum people have arranged the exhibit in the end of the western hall. For in close relation with these disinfectors—the slayers of the invisible enemies of man—are those things which remind him that "the spider's most attenuated thread is cable to man's tender tie." Here a highly-improved crematory suggests quick transit from flesh to ashes, after the transit from life to immortality. In a zinc casket, moving slowly down an inclined plane, the soul's useless tenement can slide into an atmosphere made rosy by 2,000 degrees of heat from Bunsen burners, and in a short time be reduced to remains of only five per cent. of the body.

From a sanitary standpoint, incineration leaves nothing to be desired. But its intensely practical aspect seems to lessen that solemnity which has so long accompanied the putting away of the senseless clay.

The incinerating urn follows in natural order in this department of the dead. Of these the most interesting is one which was used for holding the ashes of a Roman woman, who quit the world thousands of years ago. It is made of terra cotta and is 13½ inches long by 7 inches wide. Upon the top reposes the figure of a Roman woman, and on one side are figures in relief, representing a battle scene. Though this urn is something of a work of art, one from Alaska shows that the Indians of that savage country were not far behind the ancient Romans as expert workers in clay. With the urns and incinerators is an air-tight casket, like those in which the bodies of the officers and crew of the U. S. steamer Jeannette, who perished on the Lena Delta, were transported. In this the body is surrounded with ground cork, and the edges of the casket cemented with white lead. If anyone has fear of being "snatched" from the bosom of Mother Earth after going there for the long rest, a visit to the Museum will disclose a means for preventing such a disagreeable calamity. This robber-defier is a 400-pound iron grave vault, made of riveted boiler plate. It is so equipped with springs and bolts, that when closed there is no way of getting it open except by use of dynamite or a cold chisel.

Of all the methods followed in disposing of the dead, the most peculiar is that illustrated by a model of the Tower of Silence, from the top of which the Parsee's dead body takes its *flight.* When he starts across the "Bridge of the Gatherer," his body is taken to the

top of the Tower of Silence and laid upon a grating, which is surrounded by a low wall, where sit with black, drooping wings, the awful sanitary agents of the Parsees. As soon as the bearers have left their lifeless burden, these feathered scavengers light upon it and devour everything but the bones, which fall through the grating to the tower's bottom.

As water is a favorite element of germs, the Museum has many devices in filters, drain pipes, etc., with which to trap them. In the drainage exhibit two very old specimens of wooden drain pipe are to be seen. One, which was part of the drainage system of Washington city many years ago, is 18 inches thick, and is simply a tree log with a two-inch hole through its center. The other, of the same nature and dimensions, was taken from a street in New York city, under which it had lain for nearly one hundred years. The wood of both specimens is in a fair state of preservation; much more so than a great deal of the old iron underground pipe exhibited.

In the department of water-closets—where can be found all the up-to-date apparatus in this branch, such as bowls, urinals, traps, pipes, etc.—is seen a section of iron drain pipe which belonged to the urinal in an insane hospital. It is four inches in diameter, and is nearly full of deposits of lime and other hardening constituents of the human body. This piece of old rusty pipe perhaps contains within its narrow circumference a story of "cause and effect" that might reveal the body-history of many who became inmates of the House of the Unthroned Mind.

Although the perfect hammock—one that will not make a bow of a sailor's back—has not yet been constructed, the Museum has a bed that, while perfectly straight, swings to the motion of the ship and keeps an "even keel." Besides this there are beds, cots, litters, stretchers and a quantity of other things that remind us that man is heir to many ills. While it has been said by good authority that the best way to take wounded men from the holds of ships is to carry them upon the back, effective mechanical arrangements for this purpose have been invented. The exhibit contains a number of these, one of the best of which is a stretcher with straps for securing the legs and arms of the wounded in such a manner that they can be hoisted from, or lowered into, a ship's hold without the least fear of slipping. If transfer to another ship is desired, the stretcher, after having been gotten on deck, can be slidden upon skids—if there is an incline—to the hold of the receiving vessel.

Besides the things in the Museum, here mentioned, there are many others, an account of which may be given later. Among them are foods, clothing, microscopes, photography, micro-photography and chemistry. The three latter subjects would afford matter of especial interest.

The Museum of Hygiene offers a fine opportunity for the medical student in Washington, and many avail themselves of this source of information. Classes from the Naval Medical Department find here much that has to do with the hygienic care of ships and the prevention of epidemic disease. Here the germs that love bilge water, and the bacteria that conduct their piratical business on the high seas, can be made to divulge the secrets of their existence, so that health in ward-room and forecastle can be an assured thing.

Under the able management of Dr. Bates, the Museum is straightening out its long-cramped limbs. But there are so many limbs to be put into correct position that it takes a long time to get them all adjusted. In the store-room there is a wild confusion of illustrative material, mixed up in such a manner that we might properly call the place the Hall of Scientific Chaos. In it barrels and boxes rub noses with hygienic apparatus; imitation hams associate with anatomical specimens; canned meats lean against sham loaves of bread—and chaos finds a habitation in which to reign. At least it reigned that way when I was there last. But order would be quickly established if the Museum was possessed of a sufficiency of the one-thing-needful.

Congress does not appropriate funds for this work; and all the pecuniary help it gets must come from the Navy Department.

CASUAL VISITOR.

A HYGIENIC OBSERVATORY.

We are indebted to a recent issue of the New York *Times* for the following description of the Observatoire de Montsouris, the Municipal Hygienic Observatory of Paris:

This institution is so little known outside of France, or, one might say, of Paris, and it is of such great practical importance, that a little account of its work will certainly interest a wide circle of readers. Just at present this subject is of timely importance; because, with the union of the two great cities of New York and

Brooklyn under one government, there will occur a chance not likely to be soon repeated in America, for the establishment of a municipal observatory such that other large cities in our country may copy it when they realize the necessity for such an institution.

The Montsouris Observatory was intended primarily for the study of the relations between the atmospheric conditions and hygiene, and in carrying out these relations to their fullest extent many different topics are included. The scope of the observatory work can be best showu by a brief mention of the duties devolving upon the three principal sections or departments to which the staff of scientists are assigned.

First, there is the purely meteorological department, in which the usual elements of observation are carefully recorded and studied. These include the air pressure, temperature, moisture, and movement, and the precipitation which descends from the air. The electrical conditions of the air and the forces of terrestrial magnetism are also carefully observed. These observations are made and the results worked up with the special end in view of their application to the hygienic and climatological conditions of Paris. Tributary stations of minor importance and equipment are also in active operation in other quarters of the city.

Second, there is the chemical division, which takes up the chemical analysis of the free air in various parts of Paris, and also of the air confined in the public buildings—such as hospitals, prisons and legislative buildings. This department also investigates the subject of the composition of the water in and around Paris, including the water distributed by the water companies, the sewer water, the river (Seine) water and subterranean water, which is to be found in the various earth strata near the surface; also the questions connected with the filtration of the public supply of water are carefully studied and new processes of filtration are officially tested.

Third, the micrographical division is devoted to the microscopical study of the air, the water and the soil. Microbes and bacteria which are observed are carefully studied and their presence and development compared with the meteorological and chemical conditions observed in the other departments of the observatory.

HYGIENIC CONDITIONS SURVEYED.

It is thus seen that a physical, chemical and microscopical survey is made of the hygienic conditions of Paris. The observations

are not only made daily, but in many cases at intervals of only a few hours, and in some cases the records consist of continuous automatic registrations of the existing conditions.

A resume of the year's work is published in the annual volume of the observatory (Annuaire de l'Observatoire Municipal de Montsouris. Gauthier-Vallars et Fils, Paris.) This little volume of 550 pages can be purchased at about the cost of printing, and its contents thus become available to every one interested in it.

There are first about sixty pages of introductory matter relating to the instruments used in making the observations and the tables used in putting these results into a form proper for publication. Next follow about fifty pages of tabular matter relating to the meteorological observations previously made in Paris, such interesting facts as the highest and lowest temperature of each year since 1699, and the monthly rainfall since 1690. Much detailed matter concerning the temperature and rainfall is given for portions or nearly the whole of the present century.

The next seventy-five pages contain a full tabular climatology of Paris, based principally on the observations made at the Montsouris Observatory, and also the results of the observations made there during the previous year. These data include air pressure, air temperature, moisture, precipitation, cloudiness and the direction and velocity of the wind.

Then follows nearly forty pages devoted to the general character of each month and any special phenomena which may seem worthy of mention—such as the wind, rain and electric storms of unusual intensity or frequency, or any prevalent diseases of the respiratory organs.

The chemical analysis of the air and water requires no less than 160 pages to be devoted to its report. The water composing the fallen rain, that of flowing streams, that found in pits and drains, and that found in the various air layers—all receive careful study, and individual points of interest are dwelt upon. About twenty-five pages suffice for giving the main results of the chemical study of the air.

EXAMINING AIR AND WATER.

The 100 pages devoted to the report on the microscopical examination of the air and water is perhaps the most novel and interesting part of the publication. The observation of the organic and inorganic particles contained in the air includes the study of all kinds of bacteria, germs and microbes, and the dust particles which

are always present in the air in great numbers except on oceans. There has been followed out for years the variation, from hour to hour, day to day and month to month, in the number of microbes in the free air of the city, in the streets and on the tops of the houses; the number in the air of the hospital wards, the prisons and below ground in the sewers. Likewise a parellel scrutiny is kept up of the nitro-organisms of the waters in and near Paris.

The general inquirer finds in the published results enough material for his uses, but the specialist, or any one else who requires the more definite information, finds at the observatory the detailed records made by a competent and accurate corps of scientists, whose sole object is to note the various phenomena as they actually occur.

Let us imagine that Greater New York possesses such an observatory, or perhaps it would be better to call it a Hygienic Institute, and let us see of what use it would be. But first we must control and locate it. On account of its great practical utility and hygienic bearing it should undoubtedly be made a department of the Board of Health, and it is needless to remark that its efficiency will be in the direct proportion to its distance of removal from all political influences.

TO FOUND SUCH AN INSTITUTE.

The foundation of such an institute is by no means such a difficult matter as one might at first think. A thing well started is half done, and the nucleus for the institution already exists in the Meteorological Observatory, which has been doing such excellent work in Central Park for a good many years. No better location could be selected for the central observatory than the middle of such a large park located in the geographical centre of the city and on its densely populated environs. Of course there would be necessary an enlargement of the present scope of meteorological work accomplished by the observatory, but with very slight changes and additions it could carry on the meteorological work of the real institute. There must be joined to it, however, well-equipped and well-manned chemical and microscopical departments. These exist now, to some measure, but not in the organized form necessary for the carrying on of regular systematic observations which shall answer mutual requirements.

It is necessary to have a scientific head to such a hygienic observatory, who shall see that the work of each department is such as to make a harmonious whole. The meteorological observations

must be so made that the records can be used in working up the observations of the other two departments. In fact, each department must be supplementary to the others.

It would be easy to enlarge unlimitedly upon the benefits arising from an institution of this kind, and it must suffice here to mention only a few points. Its importance in studying the health conditions of the city as a whole, and of its various sections cannot be overestimated. The approach of conditions of the weather, air or water which are favorable for the development of certain diseases can be recognized, and precautionary measures can be taken for the prevention of the full maturing of them, where it lies within the power of man to alter the conditions. The appearance of disease in any special section of the city can be connected with some special conditions occurring there, and the Board of Health can take active measures for the suppression of the disease and the prevention of its spreading. It would have been interesting to have made a comparison between the air and water conditions of New York before and after the present system of street cleaning went into effect.

THE CISTERN—A SUBSTITUTE FOR THE COUNTRY WELL.

We have been preaching against the old well, but if we would make any progress in overcoming it, it is necessary that some substitute, which is easily available, inexpensive, and practical, should be presented. All this may be claimed for the cistern, if properly constructed and supplied with clean rain-water.

In the Atlantic States, as least, where the rainfall is about 37 inches annually, the supply is amply adequate and reliable. If the house roof is only 1,000 square feet—and many houses will furnish even more—the yearly yield of rain water collectable will be about 20,000 gallons, which at ten gallons per head per day, is more than sufficient for the wants of an ordinary family.

The cistern, however, needs not be excessively large: one, ten feet in diameter and five feet deep, will hold 2,000 gallons; and this amount could last with ordinary use more than a month; but it is very rare indeed that a month passes without some precipitation. The construction of the cistern is of the utmost importance, for

in its adaptability to keep out soil water rests its superiority to the well. If made of brick and thoroughly cemented, it will be proof, in most cases, against contamination from soil-water. I have known such a cistern to last many years without a sign of seepage. In the next place we need a filter for rain water; unless it is collected from a cleaner catch than is generally the case—from the roof—it has a peculiar flavor and odor, due to impurities washed off. For protection against these, a partition should be built in the cistern, from top to bottom. At the bottom there should be an opening connecting the two sides, or, perhaps it would be a better way to build two cisterns side by side, and connect them with a small pipe. In one apartment the filter should be constructed, three or four feet thick, with layers of sand, polarite and gravel in the order named. The top layer of sand soon becomes covered with a film containing nitrifying bacteria which aids in making the filter very efficient. The rain-water leader from the roof should, of course, discharge into the filter-side, and the pump for drawing the water be confined to the other side.

With a cistern so made and connected, I can state positively that good, relatively pure, and wholesome drinking water may be obtained. Even the ordinary cistern, without a filter, if properly cared for, is vastly safer, and therefore more desirable than the old well. If the collection is made from a tin roof kept moderately clean, the water will be odorless, generally palatable, and harmless. Such drinking water the writer has commonly used without detriment.

The collecting surface, whether tin, wood or slate, should be kept as clean as possible, especially from the fall from overhanging trees. As an additional safeguard, it is a good plan to have a "Cut off" in the roof-water leader, so that the first rainfall washing the roof may be turned off. The substitution of cisterns for wells generally would probably materially lessen the sickness rate of typhoid fevers and probably of some malarial diseases. The change should be urged by the sanitary authorities.

HARVEY B. BASHORE, M. D.

West Fairview, Pa., Dec. 9th, 1896.

WATER SUPPLY AND SEWAGE.*

By the Late Clarence O. Arey. C.E., M.D.

In taking up the subject of water supply, let us first consider a river town. Suppose that a town is located on and takes its water supply from a river and that ten miles np the river is a small town which discharges its sewerage into the river, the question which at once arises is, will the health of the lower town be good? The answer to this question will depend entirely upon the amount of sewerage discharged by the upper town in proportion to the distance between the towns and the size of the river. Let us leave out the question of chemical waste and consider only the effect of the disease-producing bacteria that are carried in sewerage.

The sewage, when small in quantity, is discharged into the river and is immediately diluted with the river water. It is tumbled over and exposed to the sun, and at every tumble thousands of bacteria are destroyed. The bacteria are filtered through the green slime growing in the rivers, going to meet their death in the filteration, till, at the end of three or four miles, the water, upon examination, is found to be pure enough for drinking purposes. But if the sewage is once allowed in the river there is no limit to its quantity, and it soon gets beyond the power of the combating agencies of nature. As to the length of time that bacteria will live in water when in contact with the combating agencies the data is not exact. In some experiments they have died out in a few days from the time of their introduction into the water, while in others they have persisted for several weeks. But on the whole, it is safe to say, if all source of infection is cut off from a body of water, that it will entirely purify itself of disease organisms inside of a few months.

In the investigations of the Massachusetts Board of Health which were carried on a few years ago, it was found that if given quantities of sewage were discharged through open beds of gravel at regular intervals, as many bacteria were found in the filtrate at the first discharge as in the waste matter discharged into the gravel bed. After the gravel bed had been in use some time, however, with the proper intervals between discharges, it was

* Read before the Civil Engineers' Club of Cleveland, June 9, 1896. Condensed from Journal Association Engineering Societies, September, 1896.

found that the filtrate running away from the gravel beds was free from a harmful percentage of bacteria. Upon investigation this was explained in the following manner: When the sewerage was first discharged through the gravel, the gravel was clean and no forms of life that are at war with the bacteria were present. During the intervals, the food for the warring elements being present, their seed became planted there and grew, thriving upon the bacteria and other material furnished by the discharges.

Now this applies directly to the water supply of all large cities where filter beds are used. Take a freshly made filter bed and the water comes through impure. After a little time algoid vegetation —the green slime—begins to grow at the bottom of the water and on the sides of the filter beds. As this accumulates the bacteria are retarded in the meshes of this fine vegetation, which in some way destroys the bacteria. Finally the meshes become so fine that even the water does not percolate. Then the bed must be cleaned, but no new filter bed, nor freshly cleaned one, should be used to supply a city with drinking water.

In the city of Berlin, some years since, a portion of the city supplied with a certain filter bed became short of water. The level of the water was raised two feet in this bed, to give a greater pressure and force more water through the filter. The result was an immediate outbreak of typhoid fever in the part of the city supplied by this particular filter bed, and in no other part of the city. The most plausible explanation is, of course, that these bacteria had been accumulated in large quantities in the meshes of the vegetation growing on the surface of the filter, and that the sudden heavy pressure had forced them through the filter before there had been time for them to meet their death at the hands of their natural enemies.

The new water works of Berlin furnish us a lesson in the scientific way in which the question is handled. Beside the usual corps of engineers, they have two bacteriological laboratories located at two different points of supply. Dr. Proskauer, who has charge of these laboratories, was the first one to show that it was not the sand alone, but the algoid vegetation on its surface that formed the filter arresting the bacteria and in some way absorbing or removing the dissolved organic matter. After the beds have been cleaned the filtrate for the first forty-eight hours is rejected. There are in this system twenty-two filter beds, of which only sixteen are in use at one time, while the remainder are being cleansed. To avoid all

possible cause of error from any flaw in the filter bed, the filtrate is examined daily in the bacteriological laboratories. Koch's three rules regarding filtration are rigidly enforced. These are:

(1) That the rate of filtration shall never exceed 100 mm. per hour.

(2) That the filtrate of each basin shall be examined daily while in use.

(3) That the filtered water containing more than 100 bacteria to the c.cm. shall be rejected or pumped back into the unfiltered reservoir.

The average number in the water as now supplied to Berlin seldom amounts to 50 bacteria to the c. cm. The unfiltered Tegel water averages about 200, while the former source of supply in Spree contained from 10,000 to 100,000 or more to the c.cm. A filter conducted on these principles should reduce the bacteria in a water that is badly contaminated, in the ratio of 1,000 to 1.

So far sewage has only been considered in the way it may affect our water supply. Now consider it by itself. In what forms do we find it, and how may the disease-producing elements which it may contain reach us? We find sewage in leeching cesspools, in earth-closets, in tight cesspools, and in the city sewers. The leeching cesspool stands in exactly the same relation to surrounding wells that the sewerage discharged into a river does to the purity of the river. If we have a small enough supply of sewage and a great enough distance, we are safe. The earth-closet, when supplied with the proper kind of earth, is a sanitary appliance. The proper kind of earth is a dry loam, or surface garden soil dried without heat, which contains the forms of life that combat the noxious bacteria.

MILK POISONING. *

By CHARLES DOUGLAS, M. D., Detroit, Michigan.
Professor of Diseases of Children and Clinical Medicine in the Detroit College of Medicine.

On February 3, 1896, I was called to attend Jessie McD——., aged five months. The child had been fed every three hours on condensed milk only. She was apparently healthy, though wax-colored and showing a tendency to the square, ricketty head. Her

* Read before the Detroit Medical and Library Association.

mother, who was very deaf, said she saw nothing wrong in the child, but the father, who was home (this being Sunday), became alarmed on account of a strange cry the child was making every few minutes, her general restlessness and the frequent loose, green, offensive stools. The child had been unnatural for two days. She vomited the day before and did not sleep the night previous to my call. This child was sitting up and at first sight did not appear sick. On close examination the pupils were dilated and little responsive to light; the head was hot, pulse slow, feet and hands cold, and the short unnatural cry was emitted regularly. There was voracious thirst, but no vomiting.

It was difficult to impress the idea of danger on the parents, and it was only after close examination that it became clear to myself. My first visit was at 4 p. m., and the child died at midnight in its mother's arms before she knew it, as she thought it was going to sleep. The stools continued of the same green, offensive character and the child acted in the same restless, crying manner, sleeping only one hour after I first saw her, till she died. There was no convulsive or twitching movements of the muscles in this patient. The meningeal irritation was indicated by the cold extremities, unnatural cry, dilated pupils, hot head, wakefulness and general restlessness. These symptoms continued in varying degrees till the child's death. The pulse gradually grew feeble, small and indistinct, and with this the coldness of the extremities became more difficult to control. Her restlessness was decided but not continuous, as she slept a little.

There was little opportunity for treatment, and no apparent benefit resulted from the mercurial purge or sedatives which were used. Externally nothing could be applied to the head, as the child resented it, becoming frightened and more restless when it was attempted. She did not vomit, and, though looking very white, was not emaciated much.

On the 4th of April of this year I was called to see Howard B——, aged two years and eight months. I found the patient pale, nervous, shrunken in flesh, thirsty, very excited and restless. His pupils were contracted closely, head and general surface very hot, temperature 104°, pulse 150°—small and irregular. His bowels were very loose. The stools were green, watery, with a little mucous and blood voided suddenly without warning and intensely offensive.

This visit was at 2 p. m., and the history given showed the child enjoying his usual health the day before when he ate some taffy made by his brother about midday. He partook of mush and milk at 4 p. m., a small supper at 6 p. m., played freely all the evening and drank milk more liberally than usual before retiring to bed at 8:20. His supper consisted of chopped beefsteak, rice pudding and half of a canned peach. All of the family partook of the same dietary except the milk. He slept well till 3 a. m., when he awoke complaining of a pain in the back, was feverish, drank water, and vomited. The vomited matter consisted of the milk principally, with some of the meat and rice pudding; also some oatmeal mush, which his mother fed him at 4 a. m. He showed restlessness and fever and continued vomiting at intervals till 9 a. m. At 7 a. m. the bowels began moving, the first two stools being natural, but the subsequent ones were watery, green, very large and intensely offensive. They continued very frequent and large and soon became streaked with blood and slime and were passed involuntarily. He had convulsive twitchings of the hands and arms from 10 a. m.

When I saw him at 2 p. m. the stools were still this way and the restlessness was very pronounced. While his head was clear on some things there was great difficulty in controlling him, and he saw things wrong. I ordered a mercurial purge at once and a cold bath, with cold applications to the head, the latter to be continued after the bath. He was opposed to these, and it was with difficulty they were continued. In addition I also gave him bromides. Treatment had apparently no effect on this child, as he became cold at 8 p. m. His senses remained impaired and he was very excited and unnatural, but knew all about him. The bowels continued purging and the emaciation was very rapid. He looked as if he had been sick two weeks. He still had those convulsive twitchings of the hands and arms which continued till death at 11 p. m., which was preceded by strong tonic contractions of all the muscles, and this remained even after death.

About a year previous to this sickness this child had an attack of poliomyelitis, with acute febrile symptoms, which lasted two weeks. During this seizure he was paralyzed in both inferior extremities. This lasted till all febrile symptoms subsided, when the paralysis also disappeared from all muscles except some of the extensors of the right leg. In a month he walked again and gradually resumed almost complete natural action even in this limb. While I had reason to suspect an inherited syphilitic taint, I could

discover no evidence of this in the child; but a brother, seventeen years older than he, had a large crop of venereal warts on his neck when a child, and now has a large perforation of the septum nasi.

The commencement of sickness in this case was undoubtedly failure of the stomach to digest the food taken during the evening previous. This was shown by the vomited matter, which was principally milk. The exciting or first disturbing cause of trouble was probably the taffy made by his brother at 2 p. m. While this child did not eat much of it, and showed no immediate symptoms from it, yet the brother, aged fifteen, who ate freely of it, did feel nauseated, and, as he expressed it, "played ball hard for four hours till this effect passed off." He did not vomit, though he feared he would for a time. It will be observed that the child showed portions of all the food taken after eating the taffy—mush at 4 p. m., meat, rice and peach at 6 p. m.—but most of the vomited material was milk. The brother who ate freely of the taffy and felt nauseated from it had no further trouble. All the family partook freely of the meat, rice, etc., at supper, and no trouble resulted with any of them. This leaves only the mush and milk at 4 p. m. and the milk at bedtime as the factors liable to cause infection of the digestive tract. Of these two foods we have no evidence of bacterial infection from the oatmeal mush, but we have unmistakeable evidence of this from the use of milk.

In the case of Jessie McD——, there can be no doubt about what agent caused the infection, as the child was fed entirely on condensed milk. I knew both children from their birth and had discussed the question of dietary in both cases very fully. The mother of Jessie, who was the fourth child, was pale, anemic, and always had to feed her babies, never having any nurse for them. In this child, as in many hand-fed ones, one of the greatest difficulties was to adjust the amount of the food to the child's digestive power of that food, and also be successful with its general development and growth. The great tendency is to over-feed, dilate the stomach and reduce the digestive capacity. It is a well-known fact that in proportion with dilation of the stomach we have always altered secretions and a resulting imperfect digestive result. This derangement increases more rapidly than the increasing age of the patient can correct, so that we frequently find children unable to digest at six and eight months such food and amount thereof as they digested well at three months. On inquiry I found that the amount fed to Jessie was an outside limit of capacity at that age. The

[illegible] children, one having died [illegible]—a very popular food with [illegible] accustomed to the vomiting and [illegible] children, and was not [illegible] but she did not apparently [illegible] milk dietary from frequent [illegible] young children. While it [illegible] cases of this character appear occasionally without apparent harm, it is well known that sudden and fatal results follow them sometimes when they are frequent, continuous and very offensive.

In healthy stomachs, even when the milk is tainted, we find that the digestive secretions, most probably through the hydrochloric acid they contain, are able to destroy all bacteria and thus give the patient immunity from infection. But in weak stomachs and those suffering from a mild gastritis we find the result otherwise. These are the cases which suffer from the poisonous results of milk dietary. The milk is an excellent culture medium, and when it is placed in the warm stomach the bacteria multiply with great rapidity when they are not destroyed by the gastric secretions. It is generally understood that trouble of this kind arises only in the warm weather of summer. Certainly this is the most common season of the year for alimentary infantile disturbances, and in direct proportion with the suddenness and intensity of the heat are the frequency and severity of the infectious results following the careless or heroic use of milk food. But while we admit that this is a summer disease, we cannot help asking why it is so? The answer is simply a temperature favorable to the rapid development of all decomposing germs and their consequent early presence and development in all nitrogenous substances left exposed to them. We see this illustrated continually in the rapid changes occurring in meats and milks in summer as against winter. Now if temperature is the factor causing these unfavorable results, we should find some evidences of these changes also in artificial summer heat steadily produced by the much used base-burner stove in many houses. While such is not common, yet I have not passed a winter for many years in which I did not find exactly this result occurring in houses where the baby was kept sleeping in a cradle or cot in the hot corner of the room, the principal other tenant of which was the ever over-heated base-burner stove. Most frequently the child occupies the hottest corner, as it is the one always least exposed

to traffic, consequently least used and most convenient in which to place a cumbrous cradle. Very commonly, I have observed, this infectious disturbance (which is the result of decomposition instead of digestion) will occur after a festive season, where children are allowed to indulge too freely in their dietary. That it does not occur more frequently in these houses is due to the fact that all the rooms are not thus heated; that the food is always kept in a cool room, and that there is no base-burner in he cow stable or the milk wagon, and consequently less milk infection is possible.

It is only within a few years that the pathogenesis of this affection has been understood. Formerly great divergence of opinion existed on this topic; some considered it a most violent inflammatory action on the lining of the bowels, primarily, and cerebral irritation following, and argued away the lack of pathological evidences to support this theory by saying that inflammatory evidences in mucous membranes frequently disappeared at death, pointing to conjunctival inflammations and their postmortem changes as a proof. Others ascribed it to a form of sunstroke produced by intense heat. Again, others construed it as inflammation of the meninges of the brain, while there were yet others who saw a solution of the cause in irritation of the nerve centres. All seemed to recognize the nervous connection in some way, most of them considering the heat as the prime cause, but totally unable to explain the connecting factor any further. It is only lately we have understood the presence of bacteria, their immensely rapid development in imperfectly digested or decomposing animal matter, their general dissemination of them and their toxins through the agency of the intestinal absorbents, and the general blood circulation to all the tissues of the body; and thus can understand the rapid diversity of symptoms which may develop from an apparently slight gastric disturbance. Here, as in any generally febrile condition, the weaker part shows an undue force of the febrile or other irritant, and the symptoms presenting prominently are those peculiar to that weak part. This was nicely illustrated in those two cases, the girl, JESSIE, being hand-fed and of a delicate mother, was developing the rickety appearance, which is strongly shown in her brotner. In this type of children the predisposition is always to cerebral irritation, which they develop very rapidly and often succumb quickly to modern sickness. All her symptoms pointed to head irritation. The boy, HOWARD, having suffered from spinal irritation a year before, indicated, by the arm twitching and tonic contractions of

the muscular system generally, irritation of the spinal cord with limited cerebral disturbance.

We are all accustomed to having a child show one or two offensive stools without any unfavorable results. This is common even in adults from any nitrogenous diet which has been taken in excess. If the amount of digestive fluid is capable of perfectly consuming, and appropriately, only six ounces at any meal, there must certainly be decomposition instead of digestion when a greater amount is taken. While in many healthy stomachs there may and undoubtedly is ability to rise to a greater effort than ordinarily required, yet it is notorious that this causes irritation of the mucous membrane with reduced working power very soon, and then decomposition of food tends to supplant healthy and perfect digestion.

It is in stomachs thus irritated that we find the most frequent unfavorable results. The question then arises, if such poisonous results are possible from this decomposition and formation of sulphureted hydrogen in the bowels, due to this immensely rapid bacterial development, why are children not killed more frequently? It is doubtful if they are not killed in this way more frequently than we recognize. Certain it is that they are often so, and more certain it is that they are continually damaged and other sickness rendered more severe by the persistence in feeding that is ignorantly allowed in acute febrile affections, where milk is freely given as a drink. How many of these acute diseases, now fatal, would be recoveries if properly dieted it is impossible to know. Certain it is if we would all give the child the same privilege of reducing his dietary that we demand ourselves when similarly sick, there would be less death.

But nature has made provisions against these dietetic abuses, other than increased effort of the digestive tract. She has recognized the liability to these mistakes, and has provided compensatory power to dispose of the extra poisonous condition of the blood which must follow unsuitable food, disease or the disassimilation following violent exercise. In the kidneys, she has provided an escape or wastegate for the residue or waste material always more or less present in the blood current. Here, in their healthy condition, it is estimated that five times the normal secretion can be voided in emergency when demanded. Thus when the blood is being overloaded at any one part with poisonous or waste material, it immediately delivers it to the kidneys for expulsion.

Again, experimental research of Bouchard and others has shown that the liver stands guard over the portal circulation, re-

ceiving, altering and destroying as necessary, the element taken up by the epithelial lining of the alimentary canal and delivered to the portal veins. The extrapoisonous results produced by injections into rabbits of blood from the portal veins over that from the general circulation clearly demonstrates this function of antidotal or synthetical power in the liver.

Now, recognizing this great protective power of these important organs, we must realize, first, that with both healthy liver and kidneys the poisonous dose from bacterial infection must be large and rapidly produced, and overcome the protective power of the liver and the eliminating power of the kidneys before it endangers, through irritation of sensitive organs, the life of the child. But, on the other hand, it can easily be seen that with either functional or organic disturbance, even of only a temporary character, in either liver or kidneys, a very moderate poisoning from bacterial milk infection due to decomposition may become a serious menace to life. It is undoubtedly due to one of these latter conditions in delicate children that we frequently find sudden and unexpected fatal results from excesses in a milk dietary, from impure milk, and from acute affections in milk-fed children.—*The Physician and Surgeon*, November, 1896.

THE HOME OF THE BEAUTIFUL; OR, THE CARE OF THE BODY.

EXTRACT FROM A RECENT SERMON.

By the Rev. J. B. KENYON, Syracuse, N. Y.

It is very likely that if we could know all the facts in the case—the padding resorted to, the intense style and thought given to fabric, and the astonishing number of garments worn—in some instances the body would seem to be much less than the raiment upon it. I have sometimes thought that a modern interpretation of the scriptural declaration that "man is fearfully and woman dreadfully made," would have respect to his attire. The monarchs of the nineteenth century are the tailor, the milliner and the modiste.

The body is worthy of proper and tasteful garmenting, for it is a palace more wonderful than ever Aladdin entered of old. In its

house the sovereign soul, the immortal and heaven-descended occupant whose years are of eternity itself. How shall this marvellous structure of clay be rendered neat for its royal occupant? Undoubtedly the answer must be "By rigidly conserving all the laws of health."

There are two important reasons why sound health is needful to us all:

First—For our greatest efficiency in the work of life. I am well aware that there have been instances of glorious genius flourishing in a feeble body. To be in harmony with the universe which God has made we ought to appear as well as we can. We cannot all be beautiful as regards star-bright eyes and a symmetrically proportioned physique. But good health is in itself a kind of beauty, and the rosy cheeks, the clear complexion and the vigorous frame attest the abounding vitality from which they spring.

Second—Again, sound health is needful for our highest happiness. Our appreciation of life and the blessing which we are enabled to extract from it will depend upon our mental condition. But the account of the mind is largely to be sought in the body. Correct thinking depends upon physical health and that depends upon correct living. Morality and even religion begin with the very food we eat. Let us briefly consider some of the requisites of physical well being:

First—Pure air. Sometimes a prayer for a good meeting is not answered because it is unable to get beyond the foul air of the room in which it is offered.

Second—Pure water for ablutions and the quenching of thirst. John Wesley declared that "cleanliness is next to godliness." I would amend the utterance by saying that "cleanliness (both physical and moral) is godliness." There is a single word in Chinese which means at once, a towel, a comb, and a woman.

Third—Let in the light. Sunshine is a destroyer of microbes.

Fourth—Do not fret. Money is a source of indigestion. "Care killed a cat."

Fifth—Dwell much with nature. So did Jesus, who withdrew again and again into the solitary place. But beauty of person is, even in the beautiful, occasional only. Let your mind be beautiful, and it will shine through and illuminate the grosser clay. If by love and nobleness we take up unto ourselves the beauty we admire, we shall spend it again on all around us.

Finally, let this mind be in you which was also in Jesus Christ.

AEROTHERAPY IN THE TREATMENT OF DISEASE.

There is no doubt whatever that at the present time physicians are inclined to rely too much upon medicinal treatment and to ignore the good effects which can be induced by out door exercise. Swedish movements, massage, and climatic change, in the treatment of disease. On the other hand it can be said with truth that in many instances most of these remedial measures cannot be resorted to because the patient cannot leave his business or has not the means which will enable him to seek those climates, mineral springs, or other remedial agents far from home, which are most indicated by his condition. No physician exists in active practice who does not meet with cases which would be benefitted by a trip abroad or to the mountains of Colorado or the plains of Arizona, and who at the same time does not find that his professional opinion is hampered by the inability of the patient to do as he suggests.

For this reason it seems important to us that some of the methods which can be employed at home for the improvement of the general health, and particularly the health of the thoracic organs should receive more attention. It is true that in a few institutions in this country and abroad there exist the so-called pneumatic cabinets in which, by means of air-pumps, the patient may be exposed to compressed or rarefied air, with the result that his pulmonary circulation and general health are improved; but the expense of these cabinets, the difficulty of their manipulation, and a lack of knowledge concerning their influences, prevent their general employment. We come, therefore, to the consideration of the cheaper and more readily provided methods which almost every physician can employ, even although his client's means be very limited.

Great improvement may be produced in the expansion of the lungs, in the action of the heart, and in the general nutrition, by a simple exercise that may be carried out in the most humble home. The patient is directed to stand perfectly erect for a period of two to five minutes, morning and night, with shoulder-blades pressed against a wall, and then to make, slowly and regularly, deep inspirations and expirations, moving his arms from his sides up to a level with his shoulders, or even bringing his hands together above his head, with the arms fully extended. It is necessary to impress the patient with the fact that during this procedure he must hold

himself as erect as possible, and that both the expirations and inspirations should be prolonged and absolutely devoid of any jerking movement.

At first it will be found that these deep pulmonary inflations cause slight vertigo of faintness, which is but another evidence of the fact that the patient's thoracic viscera have become unaccustomed to a proper expansion of the chest-walls; and in the course of a few days, or even after the first day of treatment, the patient may become alarmed by more or less severe pains in his chest, which he believes to be an evidence of pulmonary disease. As a matter of fact, the pains are but due to the unusual, yet very proper, stretching and exercise of the muscles of respiration, and while they may be disagreeable the patient can be assured that they need give him no alarm, and that a persistence in his exercise will do him great good. Such an exercise will be found of great value in those persons who, because of their indoor occupations, get little exercise and are troubled as a result with impaired digestion and poor circulation, a constant tendency to colds which fasten upon their respiratory apparatus, or who may even go so far as to be very liable to, or actually infected by, the bacillus of tuberculosis. If a measurement be taken of the circumference of the patient's chest before this treatment, and another one after it has been carried out for a month, the physician and the patient will be pleased to note the increased respiratory capacity and the general improvement in heath.

Another method of pulmonary inflation which is useful, not only in the cases we have named, but in those in which, following a pneumonia, there is an imperfect return to the healthy condition of the lung, is the use of two ordinary Wolff bottles joined by a piece of tubing in the manner about to be described. In other instances it is useful in cases in which, after a pleural effusion or empyema, the lung does not expand and fill the chest-cavity as it should. Two wash-bottles partly filled with water are joined together by means of rubber tubing which is attached to a glass tube reaching to the bottom of each bottle. Fastened to the rubber tube is a pair of artery-forceps. A little piece of paper, divided into a scale showing the fractions of an inch, is then pasted upon the side of each bottle. By means of another tube connected with the top of a second glass tube in the first bottle, the patient blows gently into this bottle and thereby forces the liquid from it into the second bottle. As soon as he has exhausted the air in his chest by this gradual expiration into the first bottle, the artery-forceps are closed upon the rubber

tube, thereby preventing the return of the displaced water; and by means of the scale on the side of the bottle a record may be made of the quantity of water he has been able to displace by one forcible expiration.

If a daily record is kept, it will usually be found at the end of two or three weeks that the quantity of water displaced by a single pulmonary expiration is greatly increased, and, simultaneously with this increase, an examination of the chest will reveal not only a better expansion of the entire thorax, but the fact that the air passes more freely through the area of the lung, which was partly consolidated or thickened; or, if the case has been one of pleural effusion, that the lung contained in the pleural cavity affected is gradually acquiring a normal expansion.

This method is particularly useful in cases of empyema where drainage has been found necessary. These cases often have, in addition to liquid in the pleural cavity, a considerable quantity of air which must be displaced through the drainage opening or be removed through a gradual process of absorption—a process which is distinctly aided by the pulmonary gymnastics just described. Here, again, it is of vital importance to impress upon the patient the necessity of performing all the movements required in a regular and gentle manner, since it is possible by a sudden expiratory or inspiratory effort to do serious harm to the lung which has been weakened through the presence of a pneumonia or a pleurisy. In other words, these exercises are resorted to with practically the same object in view as when Swedish movements are employed for the purpose of limbering up a joint which has been inflamed as a result of a traumatism or disease. Gentle and gradually increasing movements of a stiff knee will often restore to it its function; whereas any sudden, violent wrench of the part may do more harm than can ever be repaired. So, in a lung, gradual pulmonary exercise is of advantage, but any sudden wrenching of the pulmonary air-vesicles or the visceral layer of the pleura may be disastrous.

Doubtless some of the directions which have been given in this article will seem of comparatively little importance and almost homely in their character, but we are convinced from practical experience that even such readily performed modifications of the more complicated forms of aerotherapy will bring to the physician and his patient results the value of which he has no conception of unless he has given these methods careful and repeated trial.—*Therapeutic Gazette*, Dec., 1896.

PNEUMATIC SLEEPING-CARS.

Sleeping on air is the latest innovation in railway travel. The use of compressed air for this purpose will, in the estimation of railway men, eventually revolutionize railway travel, and relegate the familiar and somewhat clumsy Wagner and Pullman sleeping-cars to the back-ground.

At present the only car completely fitted with compressed-air cushions and beds is the private car of Vice-President J. N. Schoonmaker, of the Pittsburg and Lake Erie Railroad. These have been found, however, to be not only practicable, but to possess so many advantages over the accommodations of ordinary sleeping and parlor cars, that a number of roads are having similarly fitted ones constructed, and before long they will be in general use on many of the great trunk lines of the country.

Colonel Schoonmaker's car in appearance does not differ externally from the ordinary private car of railroad officials. The interior by day is that of a handsomely fitted-up parlor car. The customary chairs are seen on either side of the car, and they are covered with plush. When one sits in them, however, a marked difference is noticed from the ordinary car chair. This is explained by the fact that instead of the usual upholstering, the chair cushions are filled with compressed air, which lessens, in a great degree, to the occupant, the jolting and jarring of the car when in motion. During the day no one would for a moment suppose that he was riding in a sleeping-car, and it is not until the day coach is transformed into a sleeper that the possibilities of the use of compressed air in this direction are fully realized.

The transformation is effected in this wise: First, the air in the chair cushions is exhausted, the light framework folded up and slipped into an opening in the side of the car. Thus all the seats in the car are disposed of and it is ready for the beds.

The panels on either side of the windows open outward like a door. On the inside of these panels is a metal track, over which is drawn a steel, spring-like arrangement which supports the bed. Fitting closely against the sides of the car and concealed during the day by the closed panels is a rubber bag, folded after the fashion of an accordion.

By turning a valve connected with a storage tank beneath the car, compressed air is admitted into the rubber bag, which inflates and forces itself outward from the sides of the car until it rests upon the steel framework, and the bed is ready to be made up. The head and foot of the bed are panels, which fit also into the side of the car. When the berth or bed is not desired for use another valve is turned, and the air in the mattress expelled. The mattress itself assumes the appearance of an empty rubber bag, and is drawn back against the side of the car as before. The panels are then closed and the sleeping-car is once more ready to become the parlor car for the day traveler.

One great advantage of these appliances is that they can be fitted to steamships and dwellings as well as cars. They are particularly adapted for use in conveyances where economy of space is desirable, as on steamships, where they can be folded into the wall or state-room partition during the day, and thus give the occupant almost twice the amount of space now available. This is an advantage which any one who has had to endure cramped state-room accommodations will readily appreciate.

Other considerations which recommend this appliance to railroad men are its cleanliness, extreme lightness, and above all, its cheapness. The ordinary Pullman or Wagner sleeping-car is the heaviest and most costly built, not only in its frame, but in its fittings. Questions of strength and safety will naturally preclude a lighter frame, and therefore the possibility of lighter fittings is of the greatest importance to a railroad company.

The invention of this system will probably, for this reason, mark the most radical change in the development of the sleeping-cars, since they were first of all run in the United States over thirty years ago.—(Moody's Magazine of Medicine.)—*Railway Surgeon.*

A CHURCH DEBTOR'S EXCUSE.—A Western exchange says that a practical revivalist requested all in the congregation who paid their debts to rise. The rising was general. After they had taken their seats, a call was made for those who didn't pay their debts, and one solitary individual arose, who explained that he was an editor, *and could not because the rest of the congregation were owing him their subscriptions.*

PHYSIOLOGICAL EFFECTS OF THE RÖNTGEN TUBE.

By W. M. Stine.

No investigator who has pursued this subject with any persistency has failed, probably, to note some more or less marked effects which long exposure to Rontgen tubes have had upon the human body. The literature of observation has grown perceptibly, but that dealing with explanations of a real scientific value has been scant. Allowing for inaccuracy of observation and exaggeration of results, it is apparent that these tubes have caused certain physiological effects with resultant pathological changes. Taken collectively these have been redness and tenderness of the skin; the skin has become tanned as under exposure to powerful sunlight; the hair has fallen out from the head or hand; swelling and blistering of exposed parts; and in a few cases the inflammation has been followed by suppuration. The significant feature in all cases has been that the effects did not immediately follow the exposure to the tube, but there elapsed a few days, or as Prof. Elihu Thomson put it, "a period of incubation."

In the the earlier days of Rontgen-ray investigations one heard little of such things, and these have become common only since the introduction of the focusing tubes. Nor can such effects be due to more violent excitation of tubes alone, rather than the character of their design, for most investigators are, if anything, employing lower voltage than formerly. Based on the writer's experience, the old type of pear-shaped, glass intact tubes did not have any permanent effects on the human body, nor were such detected until the focus type was adopted.

In order to obtain a rational explanation for the pathological changes, the attempt will be made to show that they all probably result from one general effect of the Rontgen ray on the body—that of stimulation. This, however, will not directly account for the tanning of the skin. When the tube is placed but a few inches from the skin and kept in that position for at least one half hour, in a few days a discoloration of the skin takes place. The result in all its symptoms seems identical with sunburn, and whether the Rontgen ray be ultra-violet light or not, it is well established that such tubes emit ultra-violet light from secondary actions taking place within them. These actinic rays are capable of producing all the effects which follow exposure to sunlight.

From a medical standpoint inflammation results from an increased local activity of the circulation of the blood. Cohnheim found upon stimulating the tongue and mesentery of a frog that the blood vessels dilated. After a time the white corpuscles lined their walls and began to pass through them into the adjacent tissues. Once escaping from the blood vessels, the leucocytes, through their well-known amoeboid movements penetrated the tissues. Coincident with the emigration of the leucocytes, the flood constituents of the blood filtered through the walls of the blood vessels by osmosis. Virchow, another eminent authority, claims that in cases where such emigration has occurred the white corpuscles may break down into pus cells.

From some early investigations with Rontgen rays the writer was led to conclude that the immediate and perhaps only effect on the body was one of stimulation, and that this affected chiefly the white corpuscles, causing them to quicken their amoeboid movements and emigrations, and possibly their proliferation, the action being in general a tonic one. This certainly accounts for the therapeutic effects which these rays have been found to possess. The view here advanced received striking confirmation when the superficial bodily effects are studied. For example. Suppose the hand is held near a powerfully excited tube of the focus type for half an hour. The sensations accompanying the exposure are those of heat and stimulation. In the course of a few days the hand grows red and swells, and perhaps blisters will form, and in some cases suppuration may intervene. Seemingly during the exposure the leucocytes were greatly stimulated and began an emigration through the dilated walls of the blood vessels, venus and arterial. During the latent period, lasting over a few days, these leucocytes permeated the tissues and perhaps proliferated to some extent. Co-existing with these changes an exudation of serum took place, causing swelling. The presence of the leucocytes in the tissues would explain the symptoms of heat and pain in the parts affected. This condition of inflammation would continue until the white corpuscles and serous exudations were absorbed, a process which is always a tedious one at best.

So far this explanation is hypothetical and is worthy of serious attention chiefly from that it is based on certain well-established facts connected with similar inflammations produced by other causes. The demonstration must rest with the biologist, and a very inviting field is here presented to him. The final test

would be a microscopical examination of amoebae and leucocytes while under exposure to the Rontgen ray.

If the activities of such life-forms were seen to be quickened and their proliferation stimulated, what is here but hypothesis would, in all probability, become established fact, since the general physiological effects and pathological changes referred to have been fully demonstrated and are generally accepted.

The interesting question would then occur: Is such stimulation an immediate effect of the ray due to an absorption of energy? Or is it brought about by some chemical change within the cell body, or the fluids in contact with them? And further, to what extent, if any, are the more highly organized tissues stimulated?—*Electrical World.*

WHISKEY IN THE ARTS.—Half a dozen workmen were painting and paper-hanging an old widow's house. She was rich, but of rather niggardly disposition. These workmen failed by various hints to induce the old lady to provide the "allowance" which they looked for at jobs of that kind. At last one man said, "What a fine collection of pictures you have, Mrs. Barker."

"Yes," said the old lady, "but I think they would look much better if the frames were cleaned up a bit; but it would cost me too much to get them done, I'm afraid."

"Oh," said the man, "it wouldn't cost you much. I think about a quart of whiskey would do the job. Whiskey is a fine thing for cleaning picture frames."

"Would it really?" said the lady. "Well, I will get you the whiskey. Indeed, I have some in the house, I know."

The whiskey was brought and the lady retired; the men said they would send for her when the frames were done. Left to themselves, they were highly delighted at the success of their ruse, and lost no time in commencing to clean the frames with soap and water, and to drink the whiskey at intervals. At length, when both whiskey and pictures were finished, they called the lady to pronounce her opinion on their handiwork.

"Well, how do you like them?" asked one of the men.

"Oh, delightful," said the old dame; "you have indeed made a splendid job of them. And to think that a quart of whiskey would clean so many. It was lucky indeed that I saved it. It was what I washed poor little Fido in just two days before he died!"—*Life.*

MEDICAL EXCERPT.

By T. P. Corbally, A. M., M. D.

Myopia as the Result of Defective Light in School Rooms.—Dr. Giuseppe Messines, of Palermo, maintains in a recent official report* that myopia is greatly dependent upon defective natural light in school rooms. Investigations in France and Germany have abundantly shown that the development of myopia is attributable to this cause.

"There is no doubt that with the increased number of children attending school, myopia is met with much more frequently than formerly.

"The cause and the conditions favoring this increase have been examined, for the purpose of discovering at what age, and under what conditions, myopia begins.

"Layet, after many experiments, has arrived at the following conclusions:

"1st. The location of the school has a remarkable influence on the development of myopia.

"2d. Myopia is more frequently met with in the higher than in the lower schools; and in the same school, more frequently in the higher than in the lower classes.

"3d. The frequency of myopia in schools is in direct proportion to the age of the scholars, to the frequency and the length of the sessions, and the grade of the classes.

"4th. Myopia, in schools, is greater among males than females, and this possibly depends on the fact that more is required from male children.

"5th. The number of children suffering with myopia is much greater in the cities than in the rural districts.

"6th. The number of myopic children varies with the race and the nationality."

These conclusions refer only to the frequency of myopia; but research has also been made as to the degree of the myopia in the different classes of the same school.

*Bollettino della Società, d'Igiene di Palermo, Vol. III., Fasc. 3, Anno 1896.

"According to Rochard, all the statistics thus far collected show that the degree of the myopia increases in a direct ratio with the number of years of attendance at school. Therefore, in the higher classes, not only the number of cases but the degree of myopia is increased.

"The increased, and the rapidly increasing number of cases of myopia being known, it becomes necessary to find the immediate cause in order that the appropriate means may be employed to arrest the spread of this serious evil.

"There is no doubt that, in this case, hereditary influence is always to be met with, but, if it constitutes a predisposition, it is equally true that the development is due principally to the insufficient or irregular light during school hours.

"When the light thrown on the object is insufficient, the eye is naturally brought nearer to it, and seeks to adjust itself; but, it has been shown that this effort to accommodate the vision to the object, produces an elongation of the antero-posterior axis of the eye. If this effort is continued, the strain upon an organ that is in a state of development, in which the tissues are easily modified, it will be readily understood that the elongation of the axis may become permanent, and that the condition which was at first a hypermetropia may become a myopia. It is evident that if this condition is continued the myopia increases and becomes finally permanent."

Many people have expressed surprise at the frequency with which children, even young children, are seen in the streets with books on their arms on their way to school and wearing glasses with the intention no doubt to arrest progressive disease of the eyes.

The proper means of effecting a permanent cure, indeed the only means, is to improve the conditions surrounding the child in school.

The importance of light is not confined to the organ of vision, its influence is felt on other organs of the body. The experience of travelers has shown that the inhabitants at the poles suffer in many ways from the effects of the long polar winters, from nervous affections and disturbance of the functions of digestion.

Other conditions in the economy that suffer from defective light are stated and tables showing the degree of each are given.

Besides the evil results arising from the neglect, in some cases the criminal neglect, here pointed out, there are others equally frequent, and no less serious, in their consequences to the school children, to their parents and to society. Little children that have not

yet arrived at school age may be seen, on their way from school, their arms full of books, from which they are expected to prepare their lessons for the following day. The ambitious, nervous, energetic children rush to their books immediately, eager to get the task off their minds; they are fretful and impatient if asked to take exercise and rest the mind; the careless, the indifferent, are always disposed to procrastinate, their animal and physical instincts impel them irresistibly to restore the equilibrium of the functions arrested in the school room, and seek vigorous exercise; the nervous, the irritable, the peevish seek rest after returning from school; and only after the evening meal they bend fretfully over their books, are constantly asking for help. Then what of those who are not quick to comprehend, those whose memory is defective; they are willing, but slow and plodding. The next morning all these enter the classroom together, when it not uncommonly happens those who have tried the most faithfully make the most signal failures. Do the teachers, the principals, the superintendants, the school commissioners ever take into account that much of the diversity of character, temperament and intelligence depends directly on the sluggishness of the functional activity of the brain and nervous system; that in very many cases they may be forcing the brain to excessive activity which may terminate in exhaustion?

Are those who have charge of public health satisfied that they are doing their full duty to parents when they allow the physical and mental development of the young to be vitiated, to be arrested? It is said that the School Boards are contemplating the erection of many new schools; this is a proper time for those who are competent and have the authority to object, to denounce the selection of improper localities for school houses. The value of the land ought to be a matter for secondary consideration. It should be a matter distinctly kept in view that school commissioners are responsible for much of the misery that follows school life, for no small share of what is known as the deterioration of the race.

Surgical Treatment of Myopia.—M. Panas, in a report to the Academie de Medecine, *La France Medicale*, 1st January, 1897, has given a detailed historical account of surgical interference in such cases. He then gives the history of some cases of extreme severity in which he operated with great benefit to the patient. Operations previously made were rather tentative, consisting of section of the muscles, the removal of the crystaline lens which, in severe cases, were followed by the destruction of the retina. In

one of his cases he removed the crystaline, first from the left eye, which was nearly blind. This operation proving satisfactory, he performed the same operation on the right eye. The improvement in the light at long distance was quite as much as he anticipated, and near sight was nearly natural. He thinks, therefore, that this operation is perfectly admissible in severe cases, and especially in young subjects who are more than usually exposed to complications involving the retina.

THE X RAYS AND THE STEREOSCOPE.—In the name of MM. Destot and Berard, of Lyons, *Le Progres Medical*, January 9th, gives a very original and interesting report to the Academie de Medecine regarding the simultaneous employment of the X rays and the stereoscope, from which the following conclusions have been drawn:

1st. In regard to the kidneys. The arterial circulation is lumbar and terminal and allows the observer to distinguish an anterior and a posterior kidney independently, except, however, as regards the artery of the superior lobe, which is often divided into two branches, so that in injecting it the whole of the superior extremity of the kidney is injected.

2d. The interpyramidal artery is divided by a false dichotomy in the neighborhood of the cortical substance, but does not anastomose with its collateral branch; there is no arterial arch.

3d. The arteries give off, immediately, a great number of capillaries going directly to their destination, without passing through the intermediate bodies. In the injections the capillaries may be seen to take their origin directly from the arteries like the spires from a pine branch.

4th. The arteries of the pyramids come from the interior.

5th. The veins anastomose freely and the whole kidney can be injected by injecting a single branch.

SURGERY OF THE LUNGS.—This branch of the healing art has made great progress lately. M. Quenu (*Gazette Hebdomadaire*, December 20th, 1896) has made many experiments, to insure its perfect safety.

He has experimented freely on dogs for the purpose of effecting readily adherence between the pleura and the lung, in order to avoid the compression of that organ when the thoracic cavity is opened.

He has experimented on sixty dogs, for the purpose of finding the best means of effecting adhesions of the pleura. In operations

on the lungs, surgeons are divided as to the course to be pursued. One party does not fear to allow the entrance of air into the pleural cavity, and freely opens the pleura; others, dreading the results that may follow such a course, have endeavored to explore the lung through an incision in the pleura, that organ having been previously made adherent to the lung substance.

All the dogs operated on by M. Quenu in which the pleura was opened freely, suffered with severe dyspnoea, and the greater number died from apoplexy; 12 in 15 cases.

He thinks that, if, by any means adhesions of the pleura could be induced before opening the serous membrane, pneumothorax might be avoided. For this purpose, taking care that all his experiments should be made in conditions entirely antiseptic, he employed ignipuncture, acupuncture, electrolysis, the introduction of foreign bodies, sutures with silk, etc., yet, in all his experiments, he was unable to obtain any adhesion, except in cases in which a little suppuration occurred, that is, when the operation was not completely aseptic. As the processes depending on septic conditions cannot be determined, this means of obtaining adhesions of the pleura must be abandoned. The operation of costopneumopexy was performed in some cases, without causing adherences, and yet the dogs recovered from the operations.

To prevent pneumothorax there is still another means, that pointed out by M. Tuffier, which is to increase the pressure within the lungs by causing the patient to inhale compressed air, either directly, or by first performing tracheatomy and connecting the trachea with the compressed air by means of a tube. M. Quenu has found that a difference of 5 or 6 centimeters of pressure between the external air and the air in the lungs sufficed to cause a perfect adhesion of the lungs to the walls of the chest and cause a species of hernia of the organ.

He says that in serious operations on the lungs he would not hesitate to have recourse to this method.

POTT'S DISEASE.—M. Calat (*Gazette Hebdomadaire*, 3d January, 1897) removes the protuberance in Pott's disease, straightens the spine, and fixes the patient in a plaster jacket.

It is only in exceptional cases that it is necessary to have recourse to a severe operation.

The posterior bony crust, which prevents the vertebral column from being straightened, is removed. Having resected a portion of the bone behind the spinal marrow, the portion of the column

which is defectively joined is divided in front, to make two segments which may turn on each other, so that the vertebral column may be brought into a perfectly straight line.

The author has performed the operation with entire success. In 35 cases he obtained the desired correction by simple external manoeuvres preceded or not by the removal of the projecting spinal apophysis.

The object is to bring back the spine to the normal position by bending backwards the vertebral column that was previously inclined forward.

This deflexion is made by means of traction by four assistants on the upper and lower extremeties of the vertebral column while the surgeon makes firm pressure directly on the convex point. Soon the two sections of the vertebral column become disengaged, and are completely restored to the natural position. In order to preserve this position perfectly, the surgeon applies a suitable plaster jacket before the patient recovers from the anesthetic. The treatment is continued from five to ten months, instead of from two to three years, as was required by the previous methods.

This method has also the advantage of removing all danger of paralysis from pressure on the spinal marrow.

M. Calat presented five children who had been subjected to this treatment for old protuberances that had lasted from six months to six years. In these cases there was scarcely a trace of the old deformity left, yet the photographs showed that, in all, the protuberances were unusually large before the operations.

THE PASTEUR TREATMENT OF HYDROPHOBIA—A SAD RESULT IN SOME RECENT CASES.—Baltimore, January 5: Laurence Wilson, eleven years old, the last of the eight boys to be bitten by the St. Bernard dog on December 1, and the first to receive the Pasteur treatment at the institute in New York, died in terrible agony this morning. Four out of the eight boys are now dead, and prominent physicians here say that the Pasteur treatment has certainly been put to a severe and not very satisfactory test. The child was bitten over the left eye. His parents took him to the Pasteur Institute forty-two hours after the wound was inflicted. He has had the attention of several of the leading physicians in Baltimore.

His father said to-day: "The death of my boy will prove a severe strain upon the reputation of the Pasteur Institute for successful treatment of hydrophobia. In his case everything was done which

money or thoughtfulness could provide, and the directions of the head of the Institute, as well as those of the attending physicians, were carried out to the letter. He was kept in entire ignorance of the deaths of the other boys, and at no time was the slightest suggestion made in his presence which could in any way have improperly affected his mind. It is true he was severely bitten, and just where Dr. Gibier said at the beginning was the most dangerous of places, on the face. Still, he was immediately put under the treatment, and did not develop signs of the disease until more than fifteen days after he was discharged from the hospital."

CUBAN ALLIES.—Dr. Charles W. Thomas, of Chicago, on returning home from a visit to Cuba recently, asserts that if the Cubans can hold out they will never have need to win a pitched battle. *Yellow fever* and *smallpox* are doing more deadly work than the army of insurgents could do with bullets. He estimated Spain's daily expense of conducting the war at $300,000. He added:

"It is liberty or death with the Cubans. Spain will have to crush out the life of every insurgent before she can end the war. No compromise will be accepted now. Only one-sixth of the island is under cultivation. The Cubans, if free, would ask for annexation to the United States, and then the garden spot of the world would be thrown open to American colonists. Cuba could support 10,000,000 people, and under American enterprise would become the greatest wealth-producing spot in the world. Henceforth my voice will be uplifted in the interest of the patriots."

SPECIALISM.—The initiated may not know it, but as a matter of fact, we learn from the *Specialist*, there are forty-seven kinds fo rheumatism—all different. The varieties are not named, however —merely numbered. When you go to a rheumatism specialist nowadays, he doesn't tell you that your particular twinge or ache or pain, as the case may be, is so-and-so or this-and-that, but such and such a number. "I have No. 19," one rheumatic patient observed the other day, "and my mother has No. 27." In the anterooms of the specialists one may often hear conversations like this: First patient: "I have No. 15; what have you?" Second patient: "No 36; but the doctor says I have some little touch of No. 23, too." First patient: "Is that so? Do let me have a good look at you. Do you know, you're the very first person I've ever met who had No. 23!" Sounds queer, doesn't it? But, after all, what's in a name?

EDITOR'S TABLE.

SANITARIAN, FEBRUARY NUMBER, 1897.

☞ ALL correspondence and exchanges and all publications for review should be addressed to the Editor, DR. A. N. BELL, Brooklyn, N. Y.

COMMON SENSE *vs.* SENTIMENT.

It is gratifying to note in the public press the recent vote of the Old South Church, Boston, against the anti-communion cup fad that has been agitating that congregation for some time. The enterprising patentee of a silver service of thirty-seven pieces, after much canvassing and misrepresentation of the old system that had been in use in that church for over 170 years, finally came to the conclusion that he had secured votes enough to secure the adoption of his money-making device. But on submitting the subject to a vote, at a meeting held in December, it was decided by a vote of 95 to 75 in favor of continuing the service as heretofore.

From Oakland, California, we have received a copy of a petition put in circulation by a clergyman of that city invoking the health authorities to *regulate* the communion service. Not necessarily to require individual communion cups, but recommending it, as the most efficient means of protecting communicants from the imaginary dangers that he undertakes to describe.

This effort in California is a little more remarkable from the circumstance that it was in this State—at San Jose—that an epidemic of diphtheria was invented in support of a patent multiple cup tray, emanating from Rochester, N. Y., a little more than three years ago, which we took the trouble to expose (Vol. 33, p. 175). Challenging then, as we still do, the citation of a single authenticated case of any disease ever communicated by the use of the communion cup during the nearly nineteen hundred years that it has been in use by many millions of communicants.

Nevertheless, the Rev. V. Marshall Law, rector of the Church of the Advent, East Oakland, asked the Board of Health to take such steps as will do away with the common communion cup, as now used in the celebration of the sacrament. He *thinks* it is dangerous, and the more since "California is a sort of 'Mecca' to which

phthisical pilgrims from every part of the United States come. As a result, there is a greater percentage of so-called 'consumptives' in the population of California than anywhere else, except Colorado. As 'consumption' is now definitely known to be a contagious disease, and as all Christians attend to their religious duties more faithfully when in ill health than at other times, it follows that there is a particular need of safeguards in this State about the common cup in the communion service. May your petitioner presume to ask which member of your board would be willing to sip from a cup from which fifty strange persons had drunk, some of whom were known to be affected with phthisis pulmonalis."

He proceeds to compare the dangers with neglected vaccination, defective sewerage and plumbing, impure milk supply, etc., as if the laws regulating such matters were based on mere sentiment instead of demonstrated causative relation to disease.

By intimation he would have people believe that clergymen are habitually neglectful in this regard, and concludes with the following suggestions:

"First—No minister of the gospel or deacon in passing wine to communicants under 18 years of age shall permit (or ought to permit) any such communicant to drink from the cup where another has previously drunk, without first sufficiently cleansing the edge presented in presence of the person about to communicate.

Second—No minister of the gospel or deacon shall allow (or ought to allow) any communicant under the age of 18 years to drink from a supply of wine from which any other person has previously partaken.

Third—Previous to each service of the holy communion all the vessels to be used shall be completely immersed in boiling water, to which has been added sufficient bicarbonate of soda to make a strong alkaline solution."

NOTICE:
Expectoration is forbidden in this place.
Offenders are liable to a fine of $5 or a term of imprisonment.

Yet they *must* spit—those who are affected with tuberculosis. As convenient as practicable to all such notices cuspidors containing a dampened disinfecting powder of some kind should be placed. But even so, in street cars particularly, cuspidors are often inaccessible. To swallow sputum that has been raised, loaded with tubercle bacilli, is revolting and promotive of the disease. Against this, every person so affected should be provided. Bottles and other devices to hold disinfectants have been invented.

but all such devices that have fallen under our observation are inconvenient and more or less repulsive.

Japanese paper handkerchiefs are inexpensive and thoroughly adaptable to the purpose. There is no danger whatever from carrying the sputum in its damp state. Every person subject to cough and expectoration, while temporarily absent from a cuspidor charged with a disinfectant, *or from a fire*, should *carry such handkerchiefs to spit in*, and they should always be careful to *burn them up* at the first opportunity.

SWEAT SHOPS IN HIGH PLACES.—According to recent investigation by the factory inspectors, some of the most fashionable millinery and dressmaking establishments in New York city are quite as veritable sweatshops as are to be found in the tenement districts of the east side, where clothing is made by wretchedly underpaid workers, huddled together in the most narrow and unwholesome quarters. The following is a summary of some of the worst cases:

On Fifth avenue the inspector found twenty-five girls working in a cramped space, which would only hold nine if due regard to health and comfort were paid. In another fashionable place the space adapted to eighteen girls actually held twenty-eight. In a dressmaking establishment twenty-seven were found working where there should have been but thirteen. Miss Kane, the inspector, says that unsanitary crowding is general among the fashionable establishments. The lower floors are usually spacious, with luxurious furnishings. The upper floors, where the girls work from early morning until midnight, are cramped and crowded in as direct a violation of the State laws as anything discovered in the poorer class of tenement houses.

This is a state of things that should not be allowed in New York or elsewhere. And it would not be if the laws were obeyed.

FOR HEALTH AND COMFORT.—All the bath rooms in the new building of the West Side Branch of the Young Men's Christian Association, extending through the block between West Fifty-seventh and West Fifty-sixth streets, just west of Eighth avenue, are tile-floored. Besides the usual tub baths there are here a swimming pool 18 x 36 feet and twelve shower baths. The swimming pool is lined with white porcelain tiles—running around the pool is a wide coping of white marble. The water now used is Croton, which is kept up to a temperature of about 65 degrees. An arte-

sian water supply is expected later from a well now being sunk on the premises and already bored to a depth of 1,000 feet. The shower baths are lined with white marble. In the dressing rooms there are 1,200 lockers, with combination locks and forced ventilation.

The bath rooms and dressing rooms are in the basement, where also there are a bicycle room with racks for 175 wheels and two bowling alleys. The gymnasium is on the sixth floor. One of the elevators in the building runs between the gymnasium and the dressing and bath rooms.

INFECTION OF THE RIGHT KIND.—Is there anything, after all, quite so infectious as the good? There are times when one is inclined to say no, not even evil itself. In a Fifth avenue stage the other morning the snow was blurring the windows, the passengers' toes were gradually freezing and their good humor was already chilled to the bone. The vehicle was, of course, lumbering along upon its regular scheduled time, than which there is nothing slower. It would have been hardly possible for anybody to feel or look any more cross, disobliging and generally unholidaylike than those passengers in that stage at that moment. Suddenly the door opened and a woman started to get in—no, that isn't so, either; she *tried* to start to get in, but her many bundles, the little child she held under one arm, the slippery step, the swinging door, and, above all, the whirring, stinging, blinding snow made it well-nigh impossible. Again and again did the woman mount the step and almost effect an entrance, only to trip or stumble or fall back. At last, seized by a benevolent impulse as sudden as it was just then unaccountable, the man by the door snatched the biggest bundle from the woman's hand. It was a very little thing, but its example spread like wildfire. In an instant a woman had taken the little child, another man was helping the woman in and yet another was crushing his high hat against the stage top in order that she might have a seat. Every passenger of them was smiling and gracious and doing what he could to help the woman. You wouldn't have known them for the same glum, cross and shivering lot of a few moments before. That the woman was poor and shabby didn't lessen their courtesy one mite. The whole atmosphere was warmed and sweetened just by that one small kind action of the first man by the door.

A TRAINING SCHOOL FOR COLORED WOMEN.—According to the Montgomery *Advertiser*, the scheme of the New Orleans Univer-

sity Medical College to found a training school for colored women as nurses is well under way, and is assured of success. The aim is to supply at moderate rates nurses who will be competent for all the duties performed by white nurses and willing and able also to relieve the strain put upon an ordinary household by sickness instead of, as is now sometimes the case, aggravating it. Careful inquiry was made by the physicians interested in the movement to make sure that there would be a paying demand for the graduates of the school, and the result was satisfactory. No one who has had much experience with sickness is ignorant of the fact that the trained nurse of to-day is, if indispensable, extremely expensive, directly and indirectly, or that there are many cases in which less costly, even if less accomplished, attendance would be a great convenience. If colored girls can be trained to meet this need—and they unquestionably can—it will open to their race an occupation which those fitted by intelligence and character now entirely lack.

BAD BEER.—Dr. Samuel H. Phillip, of New York city, recently filed with the State Board of Health a statement that there are annually brewed in this State about ten million barrels of beer, each containing thirty-two gallons. The amount brewed would give to each man, woman and child in this State fifty-three gallons per annum. The placing of beer on the market when it only has the age of weeks, instead of months, is a prolific source of stomach trouble to the drinker. All lager should be not less than four months old; if it could be kept six months it would be still better. Young beer, as a rule, contains so much yeast that it is positively unfit to drink. A barrel of beer made from hops and malt would net the brewer $1.60. With this immense return over cost they should be compelled to manufacture a pure and unadulterated article.

In virtue of this statement, January 14, Assemblyman Horton introduced into the legislature a "pure *beer*" bill. His contention was that in every article of food or drink sold either with the consent or under the license of the State, the public should be guarded against adulteration. Yet instead of placing the subject under the surveillance of the State Board of Health, where it legitimately belongs, it provides for a new and special corps of political officials—divides the State into four inspection districts, which shall be coterminous with the four judicial departments. For each of these two inspectors will be appointed, one of whom must be a licensed chemist. The salary of these will be $2,500 each, with an allowance

of $1,000 for traveling expenses. The interesting provisions of the bill, together with the standard proposed for lager, imported beer, bock beer, ale and porter, follow:

One of the said inspectors, in the presence of the other, shall, at least once in each month, procure samples of the beverages known as lager beer, imported beer, bock beer, ale and porter from each and every brewery or place of manufacture, sale or storage of the said beverages in each of the inspection districts where the said beverages are manufactured, brewed, kept, sold or offered for sale. Such samples shall be kept in vessels in a condition to obtain a proper test and analysis thereof. Such vessels shall be properly labeled and numbered by the inspector, who is required to make the analysis.

He shall also prepare and keep an accurate list of the names of the brewers, manufacturers and vendors of the beverages from which the samples are taken, and opposite each name shall appear the number which is written or printed on the label, attached to the vessel containing the sample. A test or analysis of such samples shall be made by the inspector who has been duly licensed as a chemist, and the result thereof compared by him with the standard hereinafter set forth as the standard to be observed and followed by said inspector in the test and analysis of lager beer, imported beer, bock beer, ale and porter.

However, in presenting it, Mr. Horton said he was not irrevocably committed to anything in it except the principle involved, and should, in the course of debate, any better plan be suggested, he would be glad to adopt it. It is to be hoped that, ere it becomes a law, it will be relegated to its proper place.

ADAM SMITH ON TEMPERANCE.—It is recorded of Adam Smith, while he was composing "The Wealth of Nations," and temporarily at Bordeaux, a city living by commerce and trade, he contrasted it with Toulouse, a purely residential town, in the same spirit in which he had previously contrasted Glasgow with Edinburg, that he was greatly struck with the temperance of the people; he declared them to be the soberest people in Europe—a result due in his opinion to the cheapness of their liquor, "for people are seldom guilty of excess in what is their daily fare." In "*The Wealth of Nations*" he urged that it would conduce to temperance to reduce the duties on wine and malt ale.

THE SANITARIAN'S EMBLEM.

Editor SANITARIAN:—

DEAR SIR:—Forgive the natural curiosity of a woman. I notice on the first page of the cover of THE SANITARIAN the eagle with the motto "Public Health is Public Wealth" in his bill, and two flowers

in his claws, one of which I recognized as the poppy. What is the other one and what is their appositeness to the motto? To be "healthy, wealthy and wise," is as old as the hills. I have always thought it to mean three different things: health—and wealth—and wisdom. I possess the first only, and am seeking the other two. By the way, ought not the words of this motto to be transposed? Please oblige

A RECENT SUBSCRIBER.

NEW YORK, N. Y., January 22d, 1897.

Recent Subscriber's Inquiry is fully justified by the length of time since the SANITARIAN'S emblem was devised, and fully described by the editor thereof, in May number, 1876, of which description the following is an abstract:

In a Latin poem by Landor, Ceres is said to have created the Poppy to assuage her anguish during the search for her lost daughter; hence, in the language of flowers, the significance of the Red Poppy is *consolation.*

The other flower held in the grasp of the Eagle's claws is of the Eucalyptus (*globulus*), the sacred tree of the Australian aborigines, called by them *Yarra.*

Sir Thomas Mitchell, to whom the civilized world is indebted for the first scientific exploration of Australia (Australian Expedition, 1839), relates that groves of these trees mark the centres of the patrimonial lands of great Australian tribes. Tumuli of grass and sandy footpaths surround the clumps of their funeral squares covered with the Eucalyptus. Amidst these shaded tombs, made sacred by ancestry, the natives dwell;—reminding one of the charge of the ancient Hebrew prophet of a people—"which remain among the graves and lodge in the monuments" (Isaiah lxv., 5). The groves are described as being delightfully fragrant, filling the air at great distances with the delicate odors of balm or lemon, and other aromas indescribably delicious. All observers agree that in Australia miasmatic fevers exist in exceptional places only, where there are no Eucalyptus trees. In Van Dieman's Land these trees grow in still greater profusion, and there miasmatic fevers are unknown.

The Eucalyptus has been introduced at Cape Colony, into the French possessions in Africa, in various places in the south of France, the classic marshes of Italy, Cuba and various other countries for a sufficient length of time, and with sufficiently positive results to place its virtues as a *fever preventive tree* beyond question.

The health-protecting Eucalyptus entwined with the pain-destroying Poppy grasped by the American Eagle while holding in his bill a scroll inscribed with the most pungent declaration ever uttered by the immortal Franklin, signifies the purpose of THE SANITARIAN.

Another inquiry is received—an underscored clipping:

Mosely Wrags—Thish yer paper says they've found microbes in soap. Wot is a microbe?

Tuffold Knutt—Derned if I know—

"WOT'S SOAP?"

Microbes are discussed on another page—under Oriental Plague. To the other question we might simply refer to back volumes, where soap is a frequent subject of discussion—all the while regarded as one of the necessities of personal health and healthful conditions—*cleanliness* being, as everybody knows, next to Godliness, if not indeed necessary to that condition. But "soap" with microbes, or any other living thing in it, suggests that things are not always what they seem. Soap is essentially a compound of soluble alkali—soda, potash, or ammonia—and *oil*, the alkali being in excess; and upon the careful adjustment of this excess and perfect solubility of the alkali, depends the detergent excellence of the soap, no matter what the other properties claimed for it. For oil in its ordinary form, except in countries where olive oil is abundant, tallow in various degrees of purity, and many other *fatty substances* —and herein lies the mischief—are substituted. That soap made of the putrefying collections of the soap-fat man is liable to contain microbes is highly probable.

Soap, in its sanitary sense, depends upon the purity of the material used and the skilful adjustment of the excess of alkali, in order to avoid irritative and destructive qualities. It should be thoroughly soluble in boiling or even warm water and leave no sediment. Pyle's Pearline and O. K. soaps fulfil these conditions in eminent degree and are suitable to all household domestic purposes.

Perfumes, medicines and coloring matters, and, for use in the arts, or for special scouring purposes, Sapolio, for example, other substances are added in the process of manufacture; but none of these add anything to, while they frequently detract from the detergent qualities.

MORTALITY AND MORBILITY REPORTS AND REVIEWS.

ALABAMA.—W. H. Sanders, M. D., State Health Officer, Montgomery.

Mobile, 31,076: J. A. Abrams, M. D., Health Officer, reports for October: Deaths, 81—25 under five years of age. From consumption, 14; annual death rate, 25.68.

Selma, 7,622: J. A. McKinnon, M. D., Registrar, reports for November: Total mortality, 17, of which 4 were under five years of age; annual death rate, 20.46 per 1,000.

CALIFORNIA.—J. H. Davidson, M. D., President, Los Angeles; J. R. Lane, M. D., Secretary, Sacramento. The Secretary reports for December returns from 51 cities, towns, villages, and sanitary districts, aggregating a population of 744,280, show a mortality of 1,075—a death rate of 1.44 per 1,000, or an annual death rate of 17.28. 181 were from consumption, 91 from pneumonia, 26 from bronchitis, 7 from congestion of the lungs, 29 from diphtheria (and croup), 23 from typhoid fever, 6 from malarial fevers, 5 from cerebro-spinal fevers, 47 from cancer, 3 from erysipelas, 117 from diseases of the heart, 2 from alcoholism.

Reports of *prevailing diseases* from 25 localities outside of the larger cities and towns give 99 cases of pneumonia, 124 of bronchitis, 17 of pleurisy, 22 of congestion of the lungs, 37 of croup, 152 of measles, 36 of whooping cough, 197 of la grippe, 11 of typhoid fever, 99 of malarial fevers, 4 of cerebro-spinal fevers, 10 of erysipelas.

San Francisco, 330,000. Reports for December: Deaths, 603—111 under five years of age. From consumption, 90; acute pulmonary diseases, 80; from zymotic diseases, 38; diphtheria (and croup), 13; typhoid fever, 9; annual death rate, 20.7. Contagious diseases reported during the month: Diphtheria 60, scarlatina 33.

Semi-annual report ending December 31st: Marriages 1,643, births 2,451, deaths 2,997. The excess of deaths over births is attributed to deficiency in reports—the inefficiency of the registration law. Deaths from zymotic diseases, 225; from typhoid fever, 41; cholera infantum, 51; diphtheria (and "croup"), 45. Annual death rate, 18.15.

December 14 the Board declared the Japanese ports of Yokohama and Kobe, from which reports of the prevalence of *small-pox* have recently been received, to be infected, and imposed quarantine.

Los Angeles, 100,000. Reports for December: Deaths, 111. From consumption, 22; acute pulmonary diseases, 6; diphtheria, 8; typhoid fever, 4. Annual death rate, 13.3.

COLORADO.—*Denver.* 150,000 William P. Munn, M. D., Health Commissioner, reports for December: Deaths, 119, of which there were from typhoid fever 5 cases reported, 3 deaths; diphtheria, 20 cases, with 9 deaths; scarlet fever, 13 cases; from consumption, 27; pneumonia, 14; annual death rate, 9.52.

Annual report for 1896 (Denver *Times*, December 26). *Typhoid fever* has been more prevalent in Denver during 1896 than in any year since 1891. The total number of deaths from this cause for the year approximates ninety. There were but twelve of these in the six months ending with June; August, September and October furnished the greater number of these deaths.

Diptheria has been the greatest scourge of child life in Denver until recent years. In 1890 there were 277 deaths from diphtheria alone in a population of 106,713; in 1896 there were but nineteen deaths from diphtheria in a population of 150,000; there has been a regular decrease of mortality from this cause, and forty in 1895 was the lowest record hitherto; this year it has been diminished by more than one-half.

Scarlet fever has at times played an important part in increasing the mortality rate of children in Denver. Especially was this true in 1895. In 1896 the complete effect of the more rigid regulations has been shown in a reduction of the mortality to 22, and but one of these deaths has occurred during the last six months.

CONNECTICUT.—Professor William H. Brewer, Ph. D., New Haven, President; Professor C. S. Lindsley, M. D., Secretary, New Haven.—The Secretary's bulletin for December comprises reports from 167 towns in the State, with an aggregate population of 853,860, from which the number of deaths reported for the month was 1,142. The death rate for the larger towns is 15.6; for the smaller, 17.0, and for the whole State, 16.0. Deaths from zymotic diseases, 143—12.5 per cent. of the total mortality—chiefly from diphtheria (70), typhoid fever (11), and scarlet fever (14).

FLORIDA.—Hon. W. B. Henderson, President, Tampa; Joseph Y. Porter, M. D., State Officer, Jacksonville.

Pensacola, 15,000: A. Grant, Secretary, reports for December 22 deaths—9 under five years of age. Annual death rate, 17.6.

IDAHO.—Haily *Times*, December 21st, reports *diphtheria* and *scarlet fever* raging in half the towns of the State.

ILLINOIS.—William E. Quine, M. D., President, Chicago; J. W. Scott, Secretary, Springfield.

Diphtheria and Croup.—(Harvard *Herald*, November 20). Dr. P. W. Blanchard, health officer for the city of Harvard, is in receipt of a letter from Dr. J. W. Scott, secretary of the State Board of Health, upon the vexed question as to the difference between diphtheria and membraneous croup. Following is an extract from said letter:

SPRINGFIELD, Nov. 16, 1896.

DEAR DOCTOR:—Replying to your communication of the 14th inst., permit me to state that bacterial investigation have practically demonstrated that for sanitary purposes of quarantine, isolation and disinfection membraneous croup and diphtheria are practically identical. In the United States Marine Hospital Laboratory, such an investigation demonstrated the presence of Klebs-loeffler bacillus in 85 per cent. of the so-called cases of membraneous croup.

J. W. SCOTT, M. D., Secretary State Board.

Chicago, 1,619.226. William R. Kerr, Commissioner. Report for December: Deaths, 1,831—1,142 under five years of age. From diphtheria, 98; typhoid fever, 44; consumption, 167; pneumonia, 263; bronchitis, 118. Annual death rate, 13.41.

Chicago certainly excels any other large city in the world in simultaneously maintaining an excessive prevalence of and mortality from preventable diseases and a low death rate. The Registrar of Vital Statistics shows an actual reduction of 1,057 deaths in 1896 as compared with the deaths in 1895. In the latter year the aggregate mortality was 24,319; in the year just closed the deaths from all causes numbered 23,262—a reduction of 4.3 per cent. The reduction was entirely among children under five years of age, which age-group shows upward of 1,450 fewer deaths than in the previous year, while among ages above five years there were some 400 more deaths—185 of which, however, were from sunstroke. Death rate for the year, 14.43.

Jan. 14 (Press dispatch): In consequence of the unsanitary condition of the water supply of Chicago, the Commissioner of Health has ordered shut off the supply of water for drinking purposes in the city schools. This fact was made public at the Board of Education last night, and calls attention in a most emphatic manner to the perils which threaten the population of the city because of impure

water.—A citizen of Chicago discovered a tangled bunch of angle-worms in a glass of water, which he drew from a hydrant the other day, and in guileless simplicity took the glass and its contents to the officials of the Water Department. The Sherlock Holmes of the department at once informed him that some careless fisherman had lost the contents of his bait box on the lake, and that in the course of its wanderings the worms took refuge in the crib and from thence were transferred by easy stages to the hydrant. A man with such a faculty for reasoning should not be allowed to waste his talents in Chicago. He should be secured at once, says the Pennsylvania *Inquirer*, to explain the presence of eels and fish in the city water of Philadelphia.

And the *Bakeries* too, (Chicago *News*, Dec. 29): "We bought bread from a bakery on Jefferson street, and we cut it in half, and we were surprised to find a mouse, and if you would like to interfere in the case you would please call at 8 O'Brien street, corner of Jefferson. We have the bread to show you."

When Health Commissioner Kerr reached his office to-day he found the above communication on his desk. It was signed by M. Meyer of O'Brien street, and caused the health man to elevate his brows.

"I often get peculiar complaints, but that beats them all," said Commissioner Kerr. "I do not know of anything this department can do to help the resident of O'Brien street in his trouble. I should advise him not to deal at that particular bakery in the future."

INDIANA.—Douglass C. Ramsey, M. D., President, Mount Vernon; J. N. Hurty, M. D., Secretary, Indianapolis.

January 6th (Indianapolis *Sentinel*): The State Board of Health, through its secretary, John N. Hurty, has sent to each member of the legislature a circular urging the passage of the health law that has been drawn up and which will be presented to that body. The circular calling attention to the law is an urgent one, as indicated by the following copy:

"We address you upon a matter of great economy to the State. There is annually lost in Indiana not less than $5,000,000 through unnecessary disease and unnecessary death. It is earnestly proposed that this great sum be saved. This may be done by the legislature, if it will pass a proper health law. A bill has been carefully and studiously prepared for the consideration of the coming general assembly. Its first clause puts the present board of health out of office, and so it is plain that self-seeking does not prompt this

movement. The major portion of the bill has been drawn from the health laws of Massachusetts, New York, Michigan and Pennsylvania. These States have, through their health laws, gained much wealth and power. Why may not Indiana do likewise? The old law is inefficient and not up-to-date. It does not take account of recent discoveries in sanitary science and fails to meet many conditions necessary to accomplish thorough health work. It may be likened unto an old, wheezy engine that coughs and groans as it hauls its insignificant load. The State Board of Health does not come as a suppliant; it simply gives information that the disease and death annually known in Indiana causes enormous losses in money to the State; that much of this disease and death is unnecessary, and that a proper health law will, through prevention, save more money each year than is required to run the State government."

December 20—January 5: *Diphtheria* reported prevalent in Portland, Frankton and Wolcott.

IOWA.—E. H. Carter, M. D., President, Des Moines; J. F. Kennedy, M. D., Secretay, Des Moines.

The Secretary's *bulletin* for January reports *diphtheria* prevalent in Douglas township, Union county; Corydon; Willow township, Greene county; Germania; Burr Oak township, Mitchell county; Colfax township, Page county; Kalo; Bellaire township, Appanoose county; Shenandoah; Edna township, Cass county; Bayard; Center Junction; Union; Dodge township, Boone county; Dows; Elliott; Eden township, Marshall county; St. Charles township, Floyd county. *Measles* in Washington (epidemic); West Chester. *Scarlet Fever* in Grant township, Dallas county; Slater; Chariton. *Typhoid Fever* in Nodaway; Grand Junction; and *Whooping Cough* in York Center.

Davenport, 35,000.—A. W. Cantwell, M. D., Physician, reports for December: Number of deaths, 39—10 under five years of age. Death rate per 1,000, 13.4.

Filtering Plant.—Davenport is reputed to have one of the best filtering plants in the world. The source of the water supply is the Mississippi River. The water is drawn from a point in the bed of the river nearest the channel down into a tunnel that passes under the river's bed for a considerable distance. Through this tunnel it sweeps to the pump wells, and thence into the filters. There is no danger of contamination, as far as the sewage is concerned, for the

point in the river from which water is secured is a mile and a half above the government bridge and the point at which the Davenport sewers enter the river. At this same point the Mississippi has a current of about five miles an hour, and dashes over the Rock Island Rapids, giving it complete aeration, oxidation and dilution, all of which tend to its purification.

The filter plant consists of ten double filter shells, with a capacity of 75,000,000 gallons. These shells are of homogeneous steel of nine and one-half feet in diameter and fifty-two feet in length. Each of these is about three-quarters full of white sea sand of a peculiar nature, each grain being almost of equal texture and a perfect crystal. This sand is obtained in the Gulf of Mexico, and differs from ordinary sand in not being porous. This is claimed to be an advantage, for the reason that the microbes find no pores in the sand in which to decay and vitiate the water. Sediment and microbes remain on the surface of the sand in the filters, and these are cleaned out by jets of water applied where the impure matter is located. These jets come through horizontal perforated arms, running from a central vertical pipe which is attached to a piston in such a way that by admitting the water pressure from the mains to the piston the perforated arms are forced downward and backward through the filtering material. The result is that each separate particle of the contents of the filters is practically scoured. The impure matter thus separated floats on the water on the top of the sand, and is forced back again into the river through a drain constructed for that purpose. To obviate any possible hazards that with such a process would seem to be but few, the filter and sand bed are sterilized. It is claimed that no microbe can possibly make its way through these filters.

KANSAS.—T. E. Raines, M. D., President, Concordia; T. Kirkpatrick, M. D., Secretary, Westphalia.

Topeka.—The city physician reports for December fourteen cases of *diphtheria* and fourteen of *scarlet fever.*

KENTUCKY.—Joseph Matthews, M. D., President, Louisville; J. N. McCormick, M. D., Secretary, Bowling Green.

Louisville, 211,100—37,500 colored: Health Officer W. P. White reports for the year 1896: Deaths, 3,206—859 colored. From consumption, 389; pneumonia, 351; *typhoid fever,* 96. Death rates: White, 13.5; colored, 22.9: 18.2.

LOUISIANA.—R .S. Oliphant, President, New Orleans; G. F. Patton, M. D., Secretary, New Orleans.

New Orleans, 275,000—80,000 colored: Deaths in November, 536; colored, 202—176 under five years of age, 64 colored. Deaths from consumption, 65; pneumonia, 30; bronchitis, 14; cholera infantum, 12; enteritis, 34. Death rates—Whites, 20.55; colored, 30.30: 23.39.

MAINE.—C. D. Smith, M. D., President, Portland; A. G. Young, M. D., Secretary, Augusta.

The *Sanitary Inspector* for December, gives notes or vital statistics, based on the third annual report, as follows:

Births registered in the State in 1894, including still-births, 14,607. In 1893 there were 14,604, and in 1892, 14,028.

Marriage-rate (persons married) was 16.92 for 1,000 of population.

Divorces decreed in Maine, in 1894, there was one for every 8.2 marriages solemnized within the same year; in New Hampshire, one to every 9.7; in Vermont, one to 12.3; in Massachusetts, one to 18.6; in Rhode Island, one to 11.6; in Connecticut, one to 15.8. According to this, the State of Maine is going to the bad, as measured by this rate of matrimonial infelicity, more rapidly than any of her sister New England States.

The deaths for 1894 were 11,012. In 1893, 11,134, and in 1892, 12,147 deaths.

The death rate for Maine in 1894 was 16.54; of New Hampshire, 18.32; of Vermont, 16.27; of Massachusetts, 18.65; of Rhode Island, 19.00; and of Connecticut, 16.8.

The death-rate in the cities was 19.65, while the death-rate in the rest of the State with the cities omitted was 15.39.

The first place among the causes of death in 1894 and in 1893 was "diseases of the brain." In 1892 pneumonia occupied the first place; the usual mortality from that disease being apparently augmented by the prevalence of the outbreak of influenza.

In all three of the years pulmonary tuberculosis, or consumption, occupies the second place.

A comparison of the death-rate from the seven zymotic diseases shows that Maine has a lower death-rate from these diseases than any other New England State.

The special death-rate per 10,000 of population in 1894 was as follows for some of the principal causes of death: *Measles*, 21

deaths; death-rate, 0.32. *Scarlet fever*, 29 deaths; death-rate for the State, 0.44; for the cities, 0.56. *Whooping Cough*, number of deaths, 20; death-rate for the State, 0.30; of the cities, 0.46. *Diphtheria* (and croup), 139 deaths; death-rate 2.10. *Cerebro-spinal meningitis*, 34 deaths; death-rate, 0.51.

At the fourth quarterly meeting of the board, in December, action was taken against the Senate Bill 1,552 "for the prevention of cruelty to animals," and by direction of the board the Secretary addressed a letter to each member of Congress from Maine that, in the opinion of the State Board of Health, "the passage of the bill would put scientific investigation under so troublesome a system of espionage as to hinder very seriously the progress of biological work of the kind which has already yielded results of inestimable value to the interests of health and life, and promises still more beneficent results in the near future.

"A very scant retrospect of the work already achieved must bring to mind what Pasteur and his associates have done in reducing the fatality following the bites of rabid dogs; the remarkable diminution in the death-rate of diphtheria which has followed the use of the anti-diphtheretic serum; the successful treatment of tetanus with a similar antitoxic serum; Haffkine's method of protective inoculation against Asiatic cholera, the efficacy of which has lately been confirmed by workers in Koch's laboratory; and more recently the news that Dr. Yersin, a noted pupil of Pasteur, has successfully applied the serum therapy to a series of cases of bubonic plague in Canton, China. Besides this work for the benefit of the human race, many thousands of dollars have been saved to agriculturists by work in similar lines applied to the diseases of animals. An indispensable requisite of most of this work is experimental tests upon animals, experiments the most of which are not severely painful.

"This work it too valuable to the human race to be put under the stigma of the ban of the law, and to be impeded, as in the opinion of this board it would be, if laws like that provided in Senate Bill 1,552 were in force.

"We, therefore, respectfully ask you to use your influence against the passage of this bill."

MARYLAND.—John Morris, M. D., President, Baltimore; John S. Fulton, M. D., Secretary, Baltimore.

It is stated (*Sun*, Dec. 16) by members of the board and by physicians who are familiar with its work, that the efficiency of the board

is considerably below that of many other States because of a lack of funds to carry out thorough sanitary plans and also because of the inadequate character of the State laws governing the public health.

The board, it is claimed, can now do little more than recommend that this measure or that measure be taken to prevent the spread of an infection or epidemic. In a letter to the Governor, the Secretary writes in part as follows:

"The work of the Board of Health is, therefore, seriously hampered, and might, in the presence of a grave epidemic, be temporarily suspended for lack of funds. A board which is ill-prepared to put down small epidemics may easily be overwhelmed by a great one. It has befallen Maryland at least once within recent years to be for a time helpless when invaded by small-pox and to be assisted by health authorities from without our State.

"A commonwealth so defenseless is not only reckless of her own citizens, but is also a menace to her neighbors. The Board of Health of Maryland, facing such possibilities without immediately available resources, is in a state of emergency.

"The act providing an emergency fund refers to 'epidemics or pestilential diseases,' and in this connection we beg to report that typhoid fever is annually epidemic in Maryland. The causes are perennial, and are so widely distributed that the funds at the disposal of the State Board of Health will do but little effective work against the disease."

"A singular case of infection occurred at Powellsville, Wicomico county, which is a small village of about twenty families. An epidemic of diphtheria was reported there, and on investigation I learned that the death of a child from the disease had occurred last October and that a public funeral, which is in direct violation of the law, was held from the Methodist church at that place. The undertaker, at the request of a woman, opened the coffin and the remains were exposed to the view of the congregation.

"Some cotton had been placed around the neck of the dead child to protect the clothing from being soiled by discharges from the mouth and nose. The undertaker took some of the cotton, wiped the face with it, and tossed it away. Then the people filed up and viewed the remains. This was the start of the disease.

"The heaviest penalty of this criminally ignorant proceeding fell upon the undertaker, whose entire family, consisting of himself, wife and eight children, were all ill with diphtheria. Four of the children died."

Baltimore, 506,398—75,301 colored. James F. McShane, M. D., Health Commissioner, reports for December: Deaths, 858—671

white persons and 187 colored. Death rates: Whites, 18.68; colored, 29.92: 20.34; 252 deaths were of children under five years of age. Deaths from consumption, 111; pneumonia, 95; typhoid fever, 10; diphtheria (and "croup" 5), 49. Cases of infectious diseases reported, 337—an increase of 49 compared with the preceding month.

MASSACHUSETTS.—H. P. Walcott, M. D., Chairman, Cambridge; S. W. Abbott, M. D., Secretary, Boston.

The Board has made a report to the Legislature on its work in connection with the food and drug inspection, showing that the whole number of prosecutions against offenders for the year ending Sept. 30, 1896, was 75. Of these 68 were offences under the acts relating to the inspection of milk and milk products, and the rest on other articles of food. Seventy-four of the parties against whom complaint was made were convicted.

The attention of the Legislature is called to the provisions of law which prevent a private person from maintaining an action against a producer for selling adulterated milk. Attention was also called to the acts of 1876, by which the people are now deprived of any legal protection against the harmful action of poisonous patent medicines. The expenses of the office were $10,921.

December 18-22: *Diphtheria* reported epidemic in *Fitchburg* and *Stearnsville*.

MICHIGAN.—Hon. Frank Wells, President, Lansing; Henry B. Baker, M. D., Secretary, Lansing.

The Secretary reports for the month of December, 1896, compared with the preceding month, scarlet fever increased in area of prevalence. Compared with the average for December in the 10 years, 1886-1895, remittent fever, intermittent fever, consumption, diarrhoea, pneumonia and erysipelas were less prevalent.

Including reports by regular observers and others, *consumption* was reported present in Michigan in the month of December, 1896, at 202 places; *diphtheria* at 103 places; *scarlet fever* at 85 places; *typhoid fever* at 71 places; *measles* at 40 places and *whooping cough* at 33 places. Reports from all sources show *consumption* reported at 28 places less; *diphtheria* at 24 places more; *scarlet fever* at 41 places more; *typhoid fever* at 5 places less; *measles* at 7 places more and *whooping cough* at 14 places more in the month of December, 1896, than in the preceding month.

MINNESOTA.—Franklin Staples, M. D., President, Winona; C. N. Hewitt, M. D., Secretary, Red Wing.

St. Paul, 215,000: Alexander J. Stone, M. D., Commissioner, rereports for December: Deaths, 118—30 under five years of age. Annual death rate per 1,000 was 6.58. Deaths from diphtheria, 6; typhoid fever, 2; consumption, 15.

Minneapolis, 225,602: H. N. Avery, M. D., Commissioner, reports for December: Deaths, 146—51 under five years of age. Deaths from diphtheria, 10; consumption, 9; typhoid fever, 27. Annual death rate, 7.76. Death rate for 1896, 8.49.

"When we compare this ratio with that of some of the other large cities—Pittsburg, 13.9; Cleveland, 13.76; Cincinnati, 13.68; Brooklyn, 18.12; Newark, 16.9; Kansas City, 10.76; Boston, 27.15; Baltimore, 19.83—it is seen," the Commissioner justifiably writes, "that we have much to be proud of. This low rate of mortality in Minneapolis has not been accomplished without great work and the department keeping abreast of all modern sanitary regulations. Citizens should learn that they must co-operate with the department in observing the quarantine in all contagious diseases, and by so doing they protect themselves and save others from contagion. We should not contaminate the living by the dead by encouraging public funerals in case of death from a contagious disease. Every citizen should encourage cleanliness and assist the health officer in preserving that state of sanitation that will be most conducive to the good health of all. We are dependent upon one another and what we need is to work together."

MISSOURI.—F. J. Lutz, M. D., President, St. Louis; Willis P. King, M. D., Secretary, St. Louis.

St. Louis, 570,000—31,000 colored. M. C. Starkloff, M. D., Commissioner of Health, reports for December: Deaths, 728—214 under five years of age. From diphtheria (and "croup"), 40: phthisis, 78; typhoid fever, 5; total from zymotic diseases, 73. Annual death rate per 1,000: White, 13.6; colored, 43: 28.3. Cases of communicable diseases reported during the month, 285.

Kansas City, 165,000: George A. Coffin, M. D., Sanitary Superintendent, reports for December: Deaths, 149—45 under five years of age. From diphtheria, 7; typhoid fever, 1; phthisis (and tuberculosis), 20. Annual death rate, 10.83.

December 14—January 6: *Diphtheria* reported prevalent in Hopeton, Wood county, and McPherson.

MONTANA.—Helena (*Independent*), Dec. 8: *Typhoid fever* continues prevalent in *Rimini*.—Dec. 23—January 6: *Diphtheria* reported prevalent in *Spokane* and *Silver Bow*.

Butte (Miner, December 16): A survey of the health reports by month gives the following record of contagious diseases: In January there were 7 reported cases of diphtheria and 2 of scarlet fever; in February 2 of diphtheria and 2 of scarlet fever and 24 of measles; in March 1 of diphtheria; in April 10 of diphtheria, 3 of scarlet fever and 20 of measles; in May 5 of diphtheria; in June 20 of diphtheria, 2 of scarlet fever and 1 of measles; in July 9 of diphtheria and one of scarlet fever; in September 15; in October 10; in November 14, and at the same percentage of increase, it may be estimated that there will be at least 8 in December.

The annual death rate in Butte is only 13.3 per thousand.

Considering its limited sewer system, its sanitary condition is excellent, and its drainage is perfect. The city is kept free from all offensive and unsanitary debris. Meats, poultry, fruits, etc., are inspected regularly, and all such found unwholesome is sent to the crematory.

The markets are kept in good condition. The milk supply of the city is excellent. The ranches are well taken care of, and the cows are kept clean and in good condition. Every precaution has been exercised in contagious diseases to prevent further spreading of the same. Infected houses have been quarantined, and all thoroughly disinfected before the quarantine was raised.

NEBRASKA.—J. V. Beghtol, M. D., President, Friend; F. D. Haldeman, M. D., Secretary, Ord.

Omaha, 140,452. Reports for November: Deaths, 94. Death rate, 6.4.

Communicable diseases reported: Diphtheria, 40 cases, seven deaths; scarlet fever, 15 cases, one death.

Numerous cases of *diphtheria* are reported (McCook *Courier*) at *Clarkson*, in the northern part of Colfax county, where it has been prevalent since early in the fall, that community having been afflicted with the malady at frequently recurring periods for several years. Stringent precautions have been enforced from time to time, yet the disease oftentimes appears and carries away a father's and mother's entire group of children.

NEW HAMPSHIRE.—G. P. Conn, M. D., President, Concord; Irving A. Watson, M. D., Secretary, Concord.

Manchester (*Union*, Dec. 25) has an epidemic of *diphtheria*—86 cases with 30 deaths reported within a month.

Many of the cases, and nearly all of the more serious ones, have been reported from the little settlement sometimes called Chenetteville, just below the city dumps at the lower end. The residents there are very much incensed at the way garbage is being deposited almost in their very dooryards. They attribute the large number of cases of measles and diphtheria which have raged in their vicinity entirely to the old sculch deposited near their houses by the city teams.

NEW JERSEY.—C. F. Brackett, M. D., President, Princeton; Henry Mitchell, M. D., Secretary, Asbury Park.

Hudson County: *Jersey City* and vicinity, 338,671.—W. W. Varrick, M. D., President. During November there were 396 deaths, of which 141 were under five years of age. Annual death rate, 16.9 per 1,000. Diphtheria caused 35 deaths; scarlatina, 2; typhoid fever, 3; pneumonia, 45; bronchitis, 8; consumption, 44.

Newark, 215,725: Health Officer Chandler reports for the four weeks ending December 28: Deaths, 320—110 under five years of age; from diphtheria, 20; consumption, 39; pneumonia, 35. Annual death rate, 18.0.

Paterson, 105,040: J. L. Leal, M. D., Health Officer, reports for December: Deaths, 72—48 under five years of age; from diphtheria (and "croup"), 20; consumption, 28; pneumonia, 19; typhoid fever, 16. Annual death rate, 16.29 per 1,000. Cases of contagious diseases reported during the month: Scarlet fever, 12; diphtheria, 63; typhoid fever, 105.

December 15—January 5: *Diphtheria* reported prevalent in Salem and Gloucester counties, Bridgeton, and Woodbridge; *scarlet fever* epidemic in East Orange.

NEW YORK.—Daniel Lewis, M. D., President, New York; B. T. Smelzer, M. D., Secretary, Albany.

The Secretary's *Bulletin* for November reports: The number of deaths for the month 7,888, which represents a death rate of 14.75 per 1,000; this is the lowest death rate for years. Compared with the preceding month, in which the mortality was unusually small, the number of deaths is less by 800; there were 500 fewer deaths than were reported in November, 1895. November is uniformly

the month of lowest mortality in the year in this State; the average daily mortality for the ten preceding months of this year has been 340, while that of this month was 265, and for the past ten years there has been an average daily mortality during November of 280. a death rate of 15.75. The *infant mortality* is unusually low, 27.5 per cent. of the total deaths having occurred under the age of five years. The same is true of the *zymotic mortality*, which caused 11.3 per cent. of the total deaths, in the preceding month and likewise in the month of November, 1895; 13.0 per cent. of the deaths were from these causes. From all the diseases of this class the deaths were less than they were last month except *diphtheria*, which, however, has caused fewer deaths than during the corresponding period of last year. It has increased in the Maritime and Hudson Valley districts, and most of the districts show a moderate increase; the number of reported deaths from it is 429, and the localities reporting its prevalence are New Brighton, Cohoes, Hudson, Ogdensburg, Lyons, Eden in Erie county, and Warsaw, Wyoming county. *Consumption* caused the unusually small number of 876 deaths, 100 less than in October or than in November, 1895. The deaths from *acute respiratory* diseases were but slightly increased from last month and were less by 160 than in last November. From local diseases generally the mortality is decreased. The average mean temperature for the month was 42 degrees, the average for the past twenty years being 38 degrees. There was a rainfall of 3 inches, which was near the normal; westerly and generally southerly winds prevailed.

New York City, 1,995,000.—Report for November: Deaths, 2,574—846 under five years. Death rate, 15.70. Zymotic diseases, per 1,000, from all causes, 112.65; diphtheria, 127; typhoid fever, 34; consumption, 326; acute respiratory diseases, 400; diarrhoeal diseases, 52.

Report for the year 1896: Total number of deaths, 41,652—16,856 under five years of age. There were 103 deaths from influenza and only one from smallpox. Diphtheria caused 1,560 deaths and pneumonia 5,402. There were 765 deaths traceable directly to sunstroke, 70 to homicide and 380 to suicide. The total number of deaths was 1,767 less than in 1895. There were 20,513 marriages and 55,623 births. The number of vaccinations by the officials of the Department was 27,247.

To Control Tubercular Consumption.—January 12, the Board of Health made public one of the most important reports that had ever

been brought before it. It dealt with the prevalence of consumption in this city and was made by Dr. Hermann M. Biggs, pathologist and director of the Bacteriological laboratory; Dr. T. Mitchell Pruden, consulting pathologist, and George B. Fowler, Commissioner of Health.

After reviewing what had been done by the Health Department with the limited resources at its command to combat the disease, the report continues:—

"But the time has now arrived, we believe, when more comprehensive and radical measures should be adopted to rapidly and materially diminish the prevalence of pulmonary tuberculosis in this city.

"Some idea of the enormous sanitary importance of the subject is obtained by reference to the records of the department showing the reported cases and deaths during the past year. Nearly 9,000 cases of tuberculosis were reported to this department and nearly 6,000 deaths resulted from this disease.

"It is conservatively estimated that at least 20,000 cases of well developed and recognized pulmonary tuberculosis now exist in this city, and an additional large number of obscure and incipient forms of the disease. A very large proportion of the former cases constitute more or less dangerous centres of infection, the degree of danger depending in each instance upon the intelligence and care which is exercised in the destruction of the expectoration.

"It may be safely assumed that from the failure to safely dispose of the sputum of consumptives from thirty to fifty inhabitants of this city daily become infected by tuberculosis, and of these about one-half later die from the disease. All this suffering and death, in view of modern scientific knowledge, we know to be largely preventable by the efficient enforcement of simple, well understood and easily applied methods of cleanliness, disinfection and isolation.

"The knowledge now at command regarding the methods of extension of pulmonary tuberculosis entirely justifies the belief that its ravages can as certainly be limited by proper sanitary control and appropriate treatment as can other infectious diseases, more acute, more dramatic, and more readily communicated, but at the same time far less prevalent, less fatal, and incomparably less important to the welfare of the community.

"We fully believe that with proper regulations tuberculosis may be restricted within the narrowest bounds and eventually, perhaps, almost exterminated. This is not the idle dream of sanitary enthusiasts or theorists, but is a conviction founded upon the most thorough and conclusive experimental investigations, which have been amply confirmed by practical experience.

"In order to make possible such restriction in the prevalence of this disease, it is necessary that the Health Department shall assume a

MORE COMPLETE AND COMPREHENSIVE CONTROL.

"This requires—first, the adoption of such measures as shall make possible the general sanitary supervision of pulmonary tuberculosis under well defined conditions and regulations, differing in many respects from those applied to other more readily communicable diseases; second, the possession of such facilities for the care of the poor suffering from it as shall make possible the removal, when necessary, of those who are dangerous sources of infection.

"From the beginning of this work the officials of this department have encountered, in the utter lack of proper facilities for the care of consumptives, an obstacle to practical success so great and so disheartening that we feel impelled to urge our conviction that the grave responsibilities which rest upon the Health Department in this matter cannot longer be adequately sustained without the immediate establishment, under its direct control, of a hospital for the care and treatment of this disease.

"No week passes in which the officials of this department do not encounter many instances in which the members of many households, numerous inmates of crowded tenement houses, employes in dusty and ill-ventilated workshops and many others are exposed to imminent peril from victims of this disease, to whom either the doors of our overcrowded public institutions are closed or who reject all proffered assistance and instruction, and, from ignorance, indifference or inability through weakness due to the disease scatter infectious material broadcast, and thus diminish their own chances for recovery and imperil the health and safety of others. In such cases the sanitary suggestions of the Health Department inspectors are now futile and effective action impossible.

"We are convinced that no other factor is so potent to-day in perpetuating that ominous death list from pulmonary tuberculosis as the lack of proper facilities for the care of the poor of this city stricken with this malady.

SOURCES OF DANGER.

"The best medical opinion forbids that persons suffering from pulmonary tuberculosis be treated in association with other classes of cases in the general medical wards of general hospitals.

"The special hospitals for the treatment of pulmonary tuberculosis now existing in this city are not free public hospitals, and are quite unable to meet the demands upon them by the poor. Much larger numbers than formerly of this unfortunate class of sufferers are forced to seek admission to the already overcrowded institutions of the Department of Public Charities, as other doors are closed to them, so that further provision for them must of necessity be made by the city.

"The Department of Public Charities is not able to provide separate accommodations, excepting to the most limited extent, even for these advanced cases, and as a result actual isolation does not exist in any of the municipal institutions. In every one of the

institutions of the Department of Charities and the Department of Correction consumptives are found occupying beds in the general wards of the various hospitals, associating with healthy prisoners in the cells and in the greatly overcrowded workrooms of the Workhouse and the penal institutions.

"Many of these cases, as we know from careful investigation, are sources of actual danger to their associates. No precautions whatsoever are taken with regard to the expectoration in many instances, and everywhere the precautions taken are utterly insufficient.

"A communication has been referred recently to this board by the honorable Commissioner of Correction regarding numerous cases of pulmonary tuberculosis which exist in the Workhouse, with the inquiry whether this department could not in some way care for them. An investigation has shown that there are many cases of pulmonary tuberculosis among the inmates of the Workhouse; that these are in part in the hospital and in part among the well inmates in the sewing and work rooms, which are badly ventilated, dusty and excessively overcrowded. It was found that in these rooms there were no sanitary provisions whatsoever in regard to the expectoration, and the most favorable conditions existed for the transmission of the disease.

"As the Health Department has already declared its conviction that pulmonary tuberculosis is a communicable disease, and has taken steps looking toward its prevention, and as the information at hand shows that it is far more fatal than any other communicable disease with which the board has to deal, and destroys each year more lives than all the other communicable diseases together, it would seem self-evident that some sufficient and far reaching measures should be at once adopted to protect the inhabitants of this city from its further ravages.

SPECIAL HOSPITAL WANTED.

"The importance of provision for the separate care of persons suffering from other forms of communicable disease has long been universally admitted, and the maintenance of separate hospitals for these diseases is justly recognized as one of the most effective of the sanitary measures for securing public safety. There are most urgent reasons why similar measures should be adopted in dealing with pulmonary tuberculosis.

"We believe that such an institution in charge of the Health Department would secure all these advantages, without encroaching in any way upon the province of the institutions now caring for such patients, and would contribute as no other measure can to the success of the endeavor of the department, now pursued in the face of hopeless obstacles, to curtail the ravages of pulmonary tuberculosis in New York.

"There is no disease with which we have to deal in which our knowledge justifies more completely the conviction that it is abso-

lutely preventable and that it can be stamped out by the efficient enforcement of simple, well understood and easily applied measures of cleanliness, disinfection and isolation. These measures, furthermore, involve no hardship to the individual; and when we recall that even with a reduced death rate, nearly 6,000 persons died during 1896 in this city from tuberculosis, the vital importance of the subject is evident.

RECOMMENDATIONS MADE.

"We would therefore respectfully recommend:—

"First—That such action be taken by the Health Board as seems necessary and proper to at once secure the provision of hospital accommodations, under its charge, for the care of the poor suffering from pulmonary tuberculosis, who, as active sources of danger to the community, may properly come under its supervision.

"Second—That an amendment be made to the Sanitary Code declaring that tuberculosis be officially considered a communicable disease, and formulating regulations under which its sanitary surveillance shall be exercised.

"Third—That all institutions in this city which admit and treat cases of pulmonary tuberculosis be subjected to regular and systematic inspection by officials of this board, and that specific regulations be established for the conduct of such institutions, in accord with the proposed amendment to the Sanitary Code.

"Fourth—That the scope of the measures designed for the education of the people in regard to the nature of pulmonary tuberculosis, and the methods to be taken for its prevention, be enlarged and a closer sanitary supervision be maintained over individuals suffering from this disease in the densely populated tenement districts and in the crowded workshops and public buildings of this city."

The significance of this report and the probable action of the Board has awakened universal interest, and some surprising criticism by physicians who would apparently persuade the people that the men who of all others have given most thought to the subject and presented the most indubitable facts with regard to it, know the least about it and are the least worthy of reliance for its judicious management. This is no sudden or precipitate action by the board. But the contrary, after several years' devotion to the subject and in response, as it were, to the now universal belief that tubercular consumption is an infectious and preventable disease. And moreover, that the measures contemplated for its prevention are based upon practical knowledge.

The presumption of some of the critics that the special hospitals contemplated are to be located in the midst of the most thickly populated portions of the city—or in the city at all—is certainly

without warrant. There is nothing in the past history of the Board of Health of New York to justify such criticism as has been passed upon this proposition by some, even prominent physicians and journalists.

Brooklyn, 1,100,000.—Report for November: Deaths, 1,480—497 under five years. Death rate, 16.27. From zymotic diseases, per 1,000, from all causes, 130.00; diphtheria, 109; typhoid fever, 16; consumption, 160; acute respiratory diseases, 235; diarrhoeal diseases, 21.

Quarantine proper when the public health is in danger.—The appellate division of the Supreme Court, December 15, rendered a decision in the case on appeal of William H. Smith against Dr. Z. Taylor Emery, Health Commissioner, carried up on appeal by the latter. In 1894 Mr. Smith sued Dr. Emery in the Supreme Court for false imprisonment and secured a verdict for $500. The commissioner took an appeal and the appelate division handed down a decision reversing the judgment and ordering a new trial. The plaintiff had a store in the eastern district when the smallpox scare in April, 1894, was at its height. Dr. Shelling, one of the Health Department physicians, called upon Smith and asked to be allowed to vaccinate him. Smith refused to do so and quarantine was threatened. A police officer was stationed in front of his door next day and he was kept a prisoner until the afternoon following, when he was released by Justice Gaynor on a writ of habeas corpus. Then he brought the action. The Health Commissioner claimed that the statute gave him authority to protect the city from contagion. Smith refused to be vaccinated, he lived in the infected district and traveled about a great deal. The defense offered to introduce evidence to show the prevalence of smallpox in March, April and May of 1894, but it was excluded, wrongfully, as the appelate division holds. If, the court says, he was exposed the quarantine was proper, otherwise not. Such evidence was, therefore, proper.

Buffalo, 350,000.—Report for November: Deaths, 309—110 under five years. Death rate, 10.59. From zymotic diseases, per 1,000 deaths, from all causes, 174.20; diphtheria, 30; acute respiratory diseases, 59; consumption, 26.

Rochester, 170,000.—Report for November: Deaths, 179—46 under five years. Death rate, 12.64. From zymotic diseases, per 1,000 deaths, from all causes, 133.30; consucption, 21; acute respiratory diseases, 23.

Albany, 100,000.—Report for November: Deaths, 149—40 under five years. Death rate, 17.88. From zymotic diseases, per 1,000 deaths, from all causes, 166.67; typhoid fever, 3; diphtheria, 15.

Syracuse, 100,000.—Report for November: Deaths, 118—37 under five years. Death rate, 14.16. From zymotic diseases, per 1,000 deaths, from all causes, 125; consumption, 16; acute lung diseases, 21.

Hornellsville, Jamestown, Corning and many other large villages and small cities are in a dilemma over the decision of the State Board of Health that they shall not be allowed to pour their sewage into running streams. The Jamestown *News* warns the people of that city against expending $60,000 for sewers leading to Cassadaga Creek with such a decision staring them in the face. The question of sewage disposal is coming to the front rapidly and will not down.

NORTH CAROLINA.—George G. Thomas, M. D., President, Salem; Richard H. Lewis, M. D., Secretary, Raleigh.

December bulletin summarizes reports from 24 towns, with aggregate populations of 81,972 white and 59,513 colored, for the month of November. Deaths, 70 white, 80 colored. Death rates, respectively: 10.2, 16.1, 12.7. The chief causes were: From diarrhoeal diseases, 14; consumption, 34; typhoid fever, 8; malarial fever, 3; pneumonia, 7.

NORTH DAKOTA.—December 24—28: *Diphtheria* reported prevalent in *Edgeley; scarlet fever* epidemic in *Abercrombie.*

OHIO.—S. P. Wise, M. D., President, Millersburg; C. O. Probst, M. D., Secretary, Columbus. Dr. J. C. Crossland, of Zanesville, has been appointed member of the State Board, to succeed Dr. S. P. Wise, whose term has expired.

Cincinnatti, 350,000: J. W. Prendergast, M. D., Health Officer, reports for December: Deaths, 502—132 under five years of age. Death rate, 17.21 per 1,000; from diphtheria, 26; typhoid fever, 15; consumption, 57; pneumonia, 44.

Cleveland, 330,279: J. L. Hess, M. D., Health Officer, reports for December: Deaths, 371—143 under five years. From diphtheria, 24; typhoid fever, 9; consumption, 21; pneumonia, 34. Death rate, 13.23.

Toledo, 137,780: J. T. Woods, M. D., Health Officer, reports for December: Deaths, 117—35 under five years of age. Death rate, 10.19.

OKLAHOMA.—An epidemic of *diphtheria* is reported in *Woods county*, and it is made impossible of extinction by the criminal neglect and interference of a number of faith-cure people. They ignore quarantine orders, and hold meetings in houses where the disease exists. They have opposed the approach of physicians to patients, so that force has become necessary to obtain access to the sick. In one instance when a physician had brought a boy through the worst stages of the disease, and the nurse was obliged to go to another case, the father refused to give the medicines left or follow any of the instructions, and the boy died of blood poisoning, the family and friends sitting around and praying, but doing nothing to relieve his suffering. Several other deaths have occurred under similar conditions.

PENNSYLVANIA.—Pemberton Dudley, M. D., President, Philadelphia; Benjamin Lee, M. D., Secretary, Philadelphia.

Philadelphia, 1,188,793: Theodore B. Stulb, Health Officer, reports for four weeks ending December 26. Deaths, 1,547—492 under five years of age. From diphtheria, 127; typhoid fever, 51; consumption, 160; pneumonia, 229.

December 17—January 6: Diphtheria reported prevalent in Braddock, Murrysville, Easton, in many coke villages in Dunbar township, in Chester county, Bridgeton and throughout Lackawanna county. Typhoid fever continues prevalent in the suburbs of Coatsville.

Dr. William H. Ford, President of the Board of Health, fully endorses (*Press*, January 14) the recommendations of the New York Board of Health with regard to consumption.

Dr. Lawrence F. Flick has prepared a table which shows in a general way how the local mortality list in Philadelphia has decreased since Dr. Koch's discovery of the bacillus tuberculosis in 1882. In that year the population of the city was 886,529, and the deaths were 2,809. In 1895 the population was 1,163,864, but so great were the strides science made in the battle against consumption that the deaths were only 2,524.

According to the report of Health Officer Stulb there were 23,982 deaths in this city during 1896, an increase over the number of 1895 of 186. Of the chief causes of death there were from consumption 2,524; pneumonia, 2,696; heart disease, 1,405; diphtheria (and "croup"), 908; apoplexy, 824; marasmus, 933; inflammation of the brain, 688; bronchitis, 528; cancer, 676; typhoid fever, 402.

Pittsburg, 280,000: Report for the four weeks ending December 26: Deaths, 353—126 under five years of age; typhoid fever, 15; consumption, 26; diphtheria, 12. Death rate, 16.3.

RHODE ISLAND.—A. G. Sprague, M. D., President, River Point; Gardner T. Swarts, M. D., Secretary, Providence.

"*Monthly Bulletin, December*, 1896," summarises the deaths registered in the State with their classified causes for June, July, August and September. Total numbers for the four months respectively: 560, 814, 778, 546; from communicable diseases (except tuberculosis), 177, 152, 147, 136; tuberculosis, 76, 80, 76, 67. Diphtheria (from towns) monthly, June to November, 49, 53, 44, 69, 121, 114; typhoid fever (from towns) monthly, June to November, 13, 19, 45, 53, 30, 31; scarlet fever (from towns) monthly, June to November, 30, 26, 28, 33, 45, 92.

SOUTH CAROLINA.—*Charleston*, 65,165—white, 28,870; colored, 36,295. H. B. Horlbeck, M. D., Health Officer, reports for two weeks ending December 12: Deaths, 65—45 colored. Under five years of age, 21. Annual death rate—white, 18.0; colored, 32.0: 25.93.

SOUTH DAKOTA.—Deadwood *Times*, December 5: *Typhoid fever* is prevalent in *Lead*.

TENNESSEE.—J. D. Plunkett, M. D., President, Nashville; J. Berrien Lindsley, M. D., Secretary, Nashville.

The Secretary's bulletin reports: The principal diseases, named in the order of their greater prevalence in the State for the month of November were: Lung diseases acute, typhoid fever, malarial fever, consumption, la grippe, whooping cough, scarlet fever, diphtheria, measles, croup, chicken-pox, rheumatism, dysentery and mumps.

TEXAS.—R. M. Swearingin, M. D., State Health Officer's report for the year 1896 comprehends the details of the *Smallpox* outbreak among the negroes at Eagle Gap in July, 1895, its spread to other places, and to the latest case reported in the State, August, 1896. Total number of cases reported during the period, 211, with 21 deaths.

Consumption is recognized as being infectious, and health officers are urged to such action as will tend to restrict and prevent it. In this connection he endorses the resolution of the State Board of Health of Michigan: "That hereafter consumption and other dis-

eases due to bacillus tuberculosis shall be included in the official list of diseases dangerous to public health, requiring notice by householders and physicians to the local health officer as soon as the disease is recognized. The secretary of the board, Dr. Henry B. Baker, in giving notice of the resolution, adds the following foot note:

" 'In this resolution the question of isolation of the patient is not mentioned. Its purpose is to secure to the local health authorities the location of each case of this most dangerous disease with the view of placing in the hands of the patient reliable information how to avoid giving the disease to others, and in the hands of those most endangered information how to avoid contracting the disease.'

"The promulgation of the resolution referred to, at first seems an ungenerous blow at those who deserve our tenderest consideration, and it will doubtless be condemned by thousands of good men and women, related to those afflicted by ties of friendship and consanguinity, but the necessity for bold and active measures is imperative, and sanitarians cannot permit sentiment or sympathy to interfere.

"The rigid rules enforced against epidemic diseases need not be employed nor resorted to in the management of consumptives, but their apartments should be under the supervision of health officials, and germicidal agents should be continuously used to render them innocuous."

He reviews the quarantine stations, of which happily there has been little use during the past year, and recommends some needful repairs.

UTAH.—*Salt Lake City*, 48,076: W. T. Dalby, M. D., Health Commissioner, reports for December: Deaths, 50; from typhoid fever, 6; consumption, 3; bronchitis, 3; pneumonia, 5. Death rate, 8.57. *Diphtheria* is prevalent in *Lehi*.

WASHINGTON.—*Seattle*. Health Officer's report for November: Deaths, 37. From typhoid fever, 2 (22 cases reported); diphtheria, 2; tuberculous diseases, 5. Death rate, 7.40.

VERMONT.—C. S. Caverly, M. D., President, Rutland; J. H. Hamilton, M. D., Secretary, Richford.

Burlington, December 18: *Diphtheria* reported prevalent.

WEST VIRGINIA.—W. P. Ewing, M. D., President, Charleston; N. B. Baker, M. D., Secretary, Martinsburg.

Mountsville, January 5. The most persistent and long-continued scourge of *diphtheria* ever known is reported from the little town of *Calis*, on Wheeling creek, in Marshall county. The disease first made its appearance in the hamlet last June, and it has raged ever since. In the time intervening there have been over 150 cases and 30 deaths. Some persons have had the disease twice, and whole families have been wiped out by it.

WISCONSIN.—Solon Marks, M. D., President, Milwaukee; U. O. B. Wingate, M. D., Secretary, Milwaukee.

Milwaukee, 260,000: Walter Kempster, M. D., Commissioner of Health, reports for December: Deaths, 345—144 under five years of age. From *diphtheria*, 25; consumption, 35. Annual death rate, 15.92 per 1,000.

THE ORIENTAL PLAGUE.

What has been the particular inciting cause of the recent outbreak of plague in Bombay, it is difficult to explain. No evidence has been adduced to show that the inviting conditions prevailed unusually. The disease has prevalied there before, but so long since that the conditions common to it have probably been neglected—conditions no more common to Bombay, however, than to some other Asiatic communities, indeed to some European communities as well, and there are several American cities not above reproach in this regard, where the authorities constantly indulge conditions favorable to the introduction of epidemic disease with never a thought apparently that the *same* conditions are a perpetual menace to the health of the people by the introduction, or it may be the revival—as appears in this case—of the less common and exceptionally devastating pestilence!

Our health authorities generally appear to be sanguine that the plague is not at all likely to be introduced into this country. But it is well to bear in mind that it is a *germ* disease, infectious as well as contagious, and that however vigilant our port physicians may be, the possibility of its being introduced by means of infected material certainly exists—and the more when favored by inviting conditions, and in this respect it is analogous to cholera.

It has been observed by Sir Douglas Galton, one of England's foremost sanitarians, that in the several visitations of cholera to England, "it has generally attacked those towns and houses which offered to it the best inducements to visit them in their filth, decaying refuse, crowded and dirty population, bad water, damp, polluted

soil, or any other of those conditions which lead to bad health in a population, and which, when cholera is absent, afford an evidence of their existence by the prevalence of scarlet fever, smallpox, typhoid and other fevers, measles, whooping cough, etc.," to which *diphtheria* may be added as being more devastating than any one of the group.

Plague is historically known as a once common deadly pestilence, which had so long lain dormant—under the progress of modern sanitary measures—until four years ago when it suddenly broke out in Askabad and carried off 1,303 out of a population of 30,000, and subsequently broke out in Hong Kong, that some superficial students were wont to consider it extinct.

But the more attentively plague is studied, the more evident it appears that, like other *germ* diseases, it is contemporaneous with the existence of mankind. Indeed the more attentively the history of pestilential diseases generally are studied, in relation with modern biological science, the more certain it appears that not a single one of them has ceased to exist. The same and all exist to-day, in one form or another, as ever have existed, and they are equally liable to assert themselves under the same conditions as their wont at any period in their history. They are perpetuated by *germs*, and these, like all living things, grow only at the expense of the food with which they are provided. Their viability depends more or less upon the presence of oxygen (though some can do without it), the presence or absence of moisture, the degree of temperature, the presence or absence of other agencies—antiseptics, germicides, etc., and other conditions yet beyond our ken. But their seeds—the *spores* of disease germs, as of other bacteria—are, of all things viable, the most persistent. Indeed so long as they do not encounter congenial conditions for development, so far as time is concerned in the absence of destructive agencies, germ *spores* are practically immortal. They everywhere abide putrescible matter containing nitrogen as their condition of development, maturity and propagation.

LEPROSY IN COLOMBIA.

A correspondent of the New York *Times*, writing from Panama, November 25, reports a public meeting at that place, protesting against a bill recently presented in Congress at Bogota, to make the Island of Coiba (near Panama, off the coast of this department) a general asylum for all the lepers in the republic, which probably number 25,000.

Speeches were made by prominent persons disapproving of the project. Those present indorsed the speakers. The meeting lasted about two hours, and was exceedingly orderly, all allusions to local or national politics having been left out of the question.

The Executive Committee of the National Lazaretto in question stated in its circular of September that the bill then before Congress would soon become the law of the Republic, and that the place destined and most suitable for the purpose would be the Island of Coiba.

Out of the nine departments, or States, that form the Republic of Colombia, the Department of Panama is the only one where leprosy exists on a very small scale. In this city it may be said that leprosy as a disease does not exist. Whereas, throughout the interior of the republic, especially in the Departments of Santander, Iolima and Boyaca, there are between 25,000 and 30,000 affected with this terrible and most loathsome of all diseases, Panama standing in proportion to about ¼ per cent. of the total.

The people of this city wonder why this department, the most important in the republic, and this city especially, which is represented as being the looking-glass and reception room, as it were, of the Republic of Colombia, have been selected of all others to be the place of exile for those affected with this terrible disease, from which, so far, Divine Providence has so mercifully spared the isthmus soil. The people here are much in earnest about this question, and can see no economic or humane reason why Coiba should be used. The cost of carrying out the project is not only isthmus soil. The people here are much in earnest about this fancy, to last a few months or years; it is to last centuries, perhaps ages. The cost of erection might be less in this department, where the transportation of material is cheaper, but the cost of maintenance and transportation of lepers from the interior of the republic to this section of the country would seemingly offset all advantages that the isthmus may afford.

The Government would have to have two steamers for the transportation of lepers, one on the Atlantic coast for those on or near that coast, and the other on the Pacific, for those in Southern Colombia, as no steamship company having its interest and the welfare of its passengers at heart would undertake the regular conveyance of the lepers.

Were the Government able to compel the railroad company to transport lepers across the isthmus, there is no place where they

could be lodged in this city while awaiting to be conveyed to Coiba.

The estimate of 30,000 as the actual number of persons afflicted with leprosy is probably rather lower than higher. In his Consular report in 1890, to the Foreign Office, the British Consul at Bogota states that a well-known physician of Bogota had in an article in *The Medical Review* of that city estimated the number of cases in the Departments of Boyaca and Santander at one-tenth of the inhabitants! This, however, Mr. Wheeler, the Consul, regards as highly exaggerated, and puts the entire number in the republic at somewhere betwen 20,000 and 30,000.

It must be borne in mind, however, that six years have passed since 1890, and that all reports go to prove that the disease was then increasing. In the same year Dr. Hicks, M. R. C. S., England, practicing at Bogota, wrote to the British medical journals thus: "The local authorities have called attention to the alarming spread of leprosy in the Republic of Colombia. In districts in which the disease was formerly unknown it has appeared to spread with great rapidity."

DEATH RECORD IN THE COAL MINES.

The record of mining in the anthracite coal fields of Pennsylvania, as reported to the New York *Herald*, January 3d, shows that in all 497 lives were lost; 1,804 men were injured, some of them seriously, and as a result of these disasters 225 widows and 571 orphans have been added to the lengthening list of the helpless and the destitute who are made so because of the perils incident to this industry.

It is only when some awful catastrophe, like the recent Twin Shaft disaster, occurs that the outside public obtains a glimpse of the hazardous work of mining; but the danger is always imminent and the waste of human life continuous through these anthracite valleys.

When men are crushed to death in twos or threes, as the case may be, by the falls of roof or explosions of gas, which are frequent, it attracts but little attention; still the death list for the year makes a grim showing and brings us face to face with a phase of the business that receives but scant notice in computing the cost of mining. I have before me the statistics of the mine inspectors for the past three years, and they are full of tragic import. They show that within that comparatively brief period 1,327 men were killed outright and 4,780 were maimed in the anthracite coal mines of Pennsylvania. These sad happenings left 633 widows and 1,752 orphans to be cared for by the various poor boards and charitable

organizations of the region. And this goes on year after year with almost unvarying regularity. The lives lost in 1894 numbered 439; in 1895, 391, and in 1896, 497.

Laws have been passed by the State Legislature for improved ventilation and a systematic inspection of the mines, but there appears to be no diminution of the death rate, which is simply appalling when considered as a feature of a peaceful and essential industry.

The work of mining affords but a poor recompense at best in recent times to those who expose their lives to its perils, and when the strong man who is the sole support of his wife and little ones, or of aged parents, is struck down at his toil, destitution is immedi ately added to the grief of those who depended on him for their daily bread.

In view of the distress occasioned by the mine accidents of this region, it has been suggested that a permanent fund be created for the support of the widows and orphans of miners. This fund could easily be obtained by a tonnage tax of one or two cents a ton on the output of anthracite, without causing hardship in any quarter. There is precedent for it in the tonnage tax of three cents a ton imposed on anthracite during the war, and repealed by the Legislature of the session of 1879. On an output of 50,000,000 tons a year a tax of two cents would yield $1,000,000, and that sum would be more than adequate to meet the necessities of the case.

Mr. William Connell, of this city, recently elected member of Congress from the Lackawanna district, expressed himself in favor of such a fund a short time ago. Mr. Connell is the largest individual coal operator in the region, a man of keen sympathies and charitabe impulses, and if he should take up this matter there can be no doubt that he would make it a success.

An effort will be made at the coming session of the Pennsylvania Legislature to create such a fund by means of a light tonnage tax on coal. Such a fund would render unnecessary the frequent appeals for help that are made in behalf of the destitute relatives of the mine victims and be the means of keeping many a miner's widow and her orphans from the poorhouse.

As to whether there are any *diseases peculiar to the miner's calling*, there is evidence that, with one, or perhaps two, exceptions (*Coal Trade Journal*), there are none such. These exceptions are an affection of the eye, termed "nystagmus," and, in a lesser degree, that disease of the respiratory organs which usually goes by the

name of miner's asthma. Nystagmus, although not a prevalent affection, is one with well-marked symptoms directly traceable to the posture of the collier while at work.

The symptoms are oscillation with more or less of a rolling motion of the eyeballs, giddiness, with headache, and the appearance of objects moving in a circle, or lights dancing before the eyes.

In severe cases the person affected may stumble and be so much inconvenienced as to be obliged to stop work. Dr. Simeon Snell, of Sheffield, has given this disease special attention for about twenty years, and has published the results of his investigations, which show beyond all reasonable doubt that nystagmus is confined almost entirely to those underground workmen who are engaged in holing or undercutting coal, and is due to the miners' habit of looking upwards above the horizontal line of vision, and more or less obliquely while at work lying on his side. It has been observed also in firemen and others who have occasion frequently to examine the roof, turning the eyes obliquely while doing so. Any other occupation in which the person may habitually turn the eyes upward and sideways will induce nystagmus.

THE PASTEUR MONUMENT.

It has been decided to erect in one of the squares of Paris a monument to the memory of Pasteur. Statues or busts will also, no doubt, be located at his birthplace and in other cities. The Paris committee has, however, wisely determined that the statue obtained through international effort shall be located at Paris, where it will be seen by the greatest number of his countrymen and also by the greatest number of his admirers from other lands. The Paris committee has for honorary members, the President of the Republic and his cabinet, together with about one hundred and sixty of the most prominent officials, scientists and other distinguished citizens of France. The active members of the committee are J. Bertrand, President, member of the French Academy, Perpetual Secretary of the Academy of Sciences; J. Simon, Vice-President, member of the French Academy, Perpetual Secretary of the Academy of Moral and Political Science; Grancher, Secretary, member of the Academy of Medicine, Professor in the Faculty of Medicine.

The Paris committee has kindly extended the opportunity to the people of the United States to assist in this tribute of appreciation

and love, and have authorized the organization of the Pasteur Monument Committee of the United States.

It seems to us unnecessary to urge anyone to subscribe. The contributions of Pasteur to science and to the cause of humanity were so extraordinary, are so well known and are so thoroughly appreciated in America, that our people only need the opportunity in order to demonstrate their material interest.

Committee: Dr. D. E. Salmon, Chief of the Bureau of Animal Industry, Washington, D. C., *Chairman;* Dr. E. A. de Schweinitz, President of and representing the Chemical Society of Washington, Chief Chemist Biochemic Laboratory, *Secretary;* Dr. Geo. M. Sternberg, Surgeon-General U. S. Army, Washington, D. C., *Treasurer*; Dr. J. Rufus Tyron, Surgeon-General U. S. Navy; Dr. Walter Wyman, Surgeon-General U.S. M. H. Service; Prof. S. F. Emmons, U. S. Geological Survey, representing the Geological Society; Prof. Lester F. Ward, President of and representing the Anthropological Society of Washington; Dr. Wm. B. French, representing the Medical Society of the District of Columbia; Hon. Gardiner G. Hubbard, President of and representing the National Geographical Society; Mr. C. L. Marlatt, Assistant Entomologist U. S. Department of Agriculture, representing the Entomological Society; Dr. Ch. Wardell Stiles, Zoologist U. S. Bureau of Animal Industry, representing the Biological Society of Washington.

A MEMORIAL TO THE LATE DR. FRANCIS H. RANKIN, of Newport, R. I., is proposed to take the form of a free bed for children in the Newport General Hospital, and already numerous contributions have been received.

CONTEMPORARY LITERATURE.

WHAT FOGS ARE.

A convenient though not strictly scientific classification of fog types is, sea or coast fog, valley or hill fog, and town or dust fog. The last-named has been given the euphonic designation *nebula pulverea.* It is an artificial rather than natural condition. The Rev. Clement Ley, who gave a large portion of his life to cloud study, says, in his book on "Cloudland," that in some parts of the globe nebula pulverea is occasionally so thick as to obscure almost totally the sunlight, and in Abyssinia has led to the tradition that the plague of darkness in Egypt was in reality an unusual "'dust

fog." The amount of moisture varies so much in different fogs that the terms "dry" and "wet" are used, the scientific name of the latter being *nebula stillans.* In wet fog the particles are apt to be larger than in dry fog. A still further division, due, we believe, to Mr. Robert H. Scott, is anti-cyclonic fog, or fog in which no rain falls, while the temperature, generally low in the morning, continues to rise during the day; and cyclonic fog, in which rain does occur, while the temperature remains about stationary. Before leaving these town fogs we may notice the part played by them in affecting the health of the community. Mr. Scott has given figures showing the mortality from diseases of the respiratory system for some of the more memorable fogs of London. We have room for but one of the many periods he gives. From January 26 to February 6, 1880, London experienced eight days of fog. The average temperature at eight o'clock in the morning was 26° Fahrenheit. The total death rate was 48.1 per thousand, a rate unequalled since the last cholera epidemic, and there were no less than 1,557 deaths from diseases of the respiratory organs. It is not always an easy matter to trace direct relationship even where the statistics are carefully gathered, but there can be little doubt that these town fogs are unwholesome. Indirectly they affect the health of the community in a way few would imagine. A town fog is an excellent trap for noxious gases, holding them close to the ground. Dr. R. Barnes, studying this question, found, by inspection of gas plants near London, that in foggy weather the escaping gas was held in concentrated form in and near the works. There are other sources of contamination in foul emanations from the ground, sewers, etc. On clear, bright days, even if no wind is blowing, the law of diffusion of gases acts more effectively, and helps disperse the gases.—From "Fog Possibilities," by ALEXANDER MCADIE, in *Harper's Magazine* for January.

CONDITIONS FAVORING CONSUMPTION.

The germs of this disease cannot obtain a foothold until the resistive powers of the tissues have been reduced. There must be not only the seed but the soil. This impaired power of resistance may be the result of heredity, and this influence in the causation of disease is seldom shown to better advantage than in the history of consumption. There have been instances in which a single case introduced into a long and sound ancestry has vitiated the stock forever. How unfortunate that such matters are so little consid-

ered in marrying and giving in marriage! It is not that the disease is inherited, but the vulnerable tissues, the feeble resistive powers, render the offspring an easy prey to the ubiquitous bacillus. This weakness often shows itself by a tendency to become ill from slight causes, a sickliness, not by any means to be confounded with merely a lack of robustness or strength. One organ or part of the body, frequently the mucous membrane, is usually more prone to become affected, and the beginning of the disease can often be traced to an attack of some slight ailment. Not only the children of consumptive parents may show these characteristics, but also those of parents generally enfeebled, or whose ages are widely separated, or who are closely related by blood, or of a mother who has previously borne a number in quick succession. Even when heredity is sound, the same condition is sometimes induced by coddling, by improper feeding, by attacks of acute disease, or by want and distress. In growing children, a bad carriage of body may act injuriously by contracting and deforming the chest. The stooped position which boys sometimes assume in bicycle-riding should be discouraged for this reason.—From "Consumption and Consumptives," by WILLIAM L. RUSSELL, M. D., in *Appleton's Popular Science Monthly* for January.

THE MILLS LODGING HOUSES.

In the ordinary type of New York lodging house men sleep in great dormitories where there can be neither privacy or decency. In Mr. Mills' hotel each man will be provided with a private room, having a window opening either on the street or on the great interior court. Each room will be comfortably and cleanly furnished. On the first floor will be a magnificent system of baths, laundries where lodgers may wash their own clothing, footbaths, washrooms, etc.; also drying-rooms where men coming in with wet clothing may have it dried for wear in the morning. There will be great kitchens and ample restaurant facilities.

Especial attention will be paid to the social requirements of the men. Commodious and well-equipped reading, writing, games, and music rooms will be provided. In fact, everything possible will be done to make a real home for men, keeping them out of saloons and other evil resorts. There is no doubt that much of the prosperity of the saloons is due to the fact that they are by far more attractive and comfortable than the homes of the poor. It is not at all improbable that the entire cost of healthy, comfortable homes

and lodging houses for the entire working population of New York could be paid for from the resulting saving in the liquor bills and reduced hospital, asylum, charity, and prison expenses.

It is expected that twenty cents a night will be charged for rooms, with baths, laundries, etc., free of charge to guests, and it is believed by the most experienced that on this basis the enterprise will prove a decided financial success.

It is worthy of especial note that Mr. Mills, who has an able and sympathetic coadjutor in his son, Mr. Ogden Mills, is determined that these houses shall be confined to the worthy class of men who need such a home—sober, industrious men of the most limited means. These hotels will not be congenial places for the "tramp" and "bum."—From "Model Lodging Houses for New York," in January *Review of Reviews.*

CAUSES OF DEGENERACY IN SMALL TOWNS.—In the January number of *The American Journal of Sociology* Professor Frank W. Blackmar has an illustrated article entitled "The Smoky Pilgrims," which is a study of a single degenerate tribe in a western city. The importance of such studies is hinted at in the opening paragraph:

It is a popular belief that large cities are the great centres of social corruption and the special causes of social degeneration, while rural districts and country towns are quite free from immoral influences. It is held that the tendency of social life in a large city is downward, and that of country life is upward. No doubt that the congregation of a large population in a city has a tendency to develop in a geometrical ratio certain criminal and pauper conditions which are in marked contrast to those or sparsely settled districts, where life moves less rapidly and over-crowding is less apparent. Yet the country has its own social evils and social residuum; for while an abundance of fresh air and sunshine may be in themselves redeeming features of social improvement, it takes something more than these to make a healthy social atmosphere. The limits of industry are as certain in the country as in the city, and if more seek labor than are able to find it there is a clear case of economic over-crowding. While this over-crowding is less marked, a man without a place in the world is as much crowded out when the broad fields are before him as in the large city, amidst the rush of hurrying industry. While the country has some advantages over the city in respect to the condition of the poor and unfortunate it may appear after all that social degeneration in the country, if not quite in proportion to the decline in large cities, according to the population, moves with accelerating ratio.—*University of Chicago Press.*

THE SANITARIAN.

MARCH, 1897.

NUMBER 328.

PREVENTIVE MEDICINE.*

BY GEORGE M. STERNBERG.

Sanitary science is a branch of medicine based upon chemical and physiological knowledge which has been gained by the painstaking researches of a host of investigators who have determined the constituent elements of the air we breathe, the water we drink, the food we eat and the nature of the harmful impurities found in these; it teaches us the difference between healthful indulgence in food, exercise, mental activity, etc., and those excesses which lower the vital resisting power and establish a predisposition to disease. Preventive medicine, which is a broader term, if we regard the beneficent results accomplished, must be placed in advance of therapeutics. Where thousands have been saved by the timely administration of suitable medicines, or by the skilfully performed operation of the surgeon, tens of thousands have been saved by preventive medicine. And preventive medicine is to-day established upon a strictly scientific foundation. If our practice was *pari passu* with our knowledge, infectious diseases should be almost unknown in civilized countries, and those degenerative changes in vital organs which result from excesses of various kinds would cease to play a leading part in our mortuary statistics. But while our knowledge is still incomplete in some directions, and while individual communities constantly fail to act in accordance with the well-established laws of health and the scientific data which furnish the basis of preventive medicine, the saving of life directly traceable to this knowledge is enormous.

* Abstract from "Science and Pseudo-Science in Medicine" (Science, Feb. 5), read before the Anthropological Society of Washington, December 15, 1896.

Smallpox no longer claims its victims in any considerable numbers except in communities where vaccination is neglected; the last epidemic of yellow fever in the United States occurred nearly twenty years ago; cholera has been excluded from our country during the last two wide-spread epidemics in Europe, and its ravages have been greatly restricted in all civilized countries into which it has been introduced; the deadly plague of the sixteenth and seventeenth centuries is no longer known in Europe, and the prevalence of typhus (so-called 'spotted' or 'ship fever') has been greatly limited. Typhoid fever, tuberculosis and diphtheria are still with us and claim numerous victims, but we know the specific cause of each of these diseases; we know where to find the bacteria which cause them and the channel by which they gain access to the human body; we know how to destroy them by the use of disinfecting agents ('antiseptics'); and in the case of diphtheria we have recently discovered a specific mode of treatment which when promptly applied reduces the mortality from this dread disease to a comparatively small figure.

The brilliant success which has attended the carrying out of modern antiseptic methods in surgical and obstetrical practice are too well known to call for extended remark.

Sir Edward Arnold, in an address delivered at St. Thomas' Hospital, upon "Medicine, Its Past and Future," says:

"One of the highest authorities already quoted has furnished a calculation of the salvages of life effected even during the early years of the present reign by the commencing improvements in preventive and curative medicine. In the five years from 1838 to 1842, London with an average population of 1,840,865 persons, had an average annual mortality of 2,557 in every 100,000. In the five years from 1880 to 1884 the average metropolitan population was 3,894,261, and the average annual death rate 2,101 in 100,000. A calculation will show that these figures represent a saving or prolonging of lives during that lustrum to the number of 96,640. The mean annual death rate has now been reduced to a point lower than shown in these figures. It was 22.16 per 1,000 for England and Wales at the commencement of the reign, and it is to-day better than 19.0 per 1,000, while in Her Majesty's army and navy the diminution of mortality apart from deaths from warfare has proved even more remarkable, and in India, where we used to lose 69 per 1,000 yearly, this has been reduced to 16 per 1,000."

HYGIENIC SELF-DEFENSE.*

By the Rev. Rabbi Voorsanger, San Francisco, Cal.

Last summer's agitation by the Board of Health of our city has resulted in an appropriation in favor of that department that exceeds the previous year's appropriation by $30,000. The Board of Health doubtless feels that with this additional money it can judiciously introduce certain reforms, which in the interest of public health are sorely needed.

We shall not inquire whether the generosity of our city fathers was the outcome of their convictions, or the result of public pressure by sensible tax-payers, who insist on this wise and necessary expenditure. We thank the Board of Supervisors. We give their compliance with the members' wishes our public commendation, and we venture to express the hope that our venerable Aldermen may hereafter always understand the wisdom of liberal appropriations for objects that appeal to the good sense of the public, without the interference of public meetings or long-footed petitions.

Just this much by way of prelude or introduction. The public health is a proper subject for public discussion. It is more important than politics. The campaign for gold or the election of a President fades into insignificance before this pregnant subject. Health, sanitation, hygiene are subjects we may hope some day to be deemed as important as the three R's in the curriculum of public education. The secret of public health is the knowledge of every individual to take proper care of himself, who not only desires to live long, but it is his duty to prolong his life; after the commonwealth understands the means of attaining the prolongation of the life of the citizen, we may bow to a community that proceeds intelligently in the path of public duty, which must result in lasting happiness. We should avail ourselves of all intelligent means to live long. Without calling into play the dubious adage that self-preservation is the first law of nature, we may discreetly say that self-defense is a private and public duty, and an expression of civil virtue. We have learned that a community may defend itself

*Lecture on "Our Public and Private Enemies," at the Temple Emanu-El, San Francisco. October 16, 1896.

against foreign assaults by devising fortresses and armaments that shall be a bar ingress or capture. We know that the ancient castle always stood on a miniature island, surrounded by a moat, which was the first line of defense against an inimical force.

We also recommend the acquisition of the so-called manly art, the art of self-defense, which enables the weak man to parry with skill and dexterity the assaults of brute force. If we learn to defend ourselves against physical aggression, why not learn also to defend ourselves against the enemies of health. If we steel our muscles to keep out the enemy and drill our young men to become a defense of power, why should we not drill our minds to understand the means by which disease and pestilence, destruction and premature death can be kept away from our homes? The trouble with the generality of the people is that they dread an enemy only when he is nigh. Most citizens are unconscious of danger until they hear the bombs whistling in the air. They do not believe in cholera until the first victims are carried to the grave. They do not believe in death until it strikes home. The experience of others is insufficient to teach them, and yet that is the best teacher—experience, the record of which makes the history of nations—to guide us in determining that the battlefield takes not as many victims who died before their time, as the folly and ignorance of man, the two grim messengers of death, who come in stealth and often disguise themselves in the most charming attire and lure the unwitting to their destruction.

OUR INDIFFERENCE TO DANGER.

We need to learn the art of hygienic self-defense. I stated above that the secret of public health was the knowledge of every individual to take care of himself. Unfortunately, that maxim is stronger in theory than in application, for most people, liberally speaking, either do not know or are too weak morally to take care of themselves. If the prolongation of life is a civil duty there are more suicides than we wot of. The lives of suicides are prematurely closed by their ignorance or their folly. We commit suicide with eating and drinking. We cram our bodies with too much poor, unwholesome fare, poison food; as to drinking, we stab our bodies with alcoholic poniards, and whilst we toast the delights of exhilaration we are slowly bleeding to death. We commit suicide with our vanities and follies; we make day of night, and night of day with highway robbery of rest and excessive abuse of our vital forces. We commit suicide with our love raiment, our love of

adornment, because our mirror is a traitor, bidding us resort to poisons to appear beautiful.

We deem a public opium fiend a suicide, and the man also who in a moment of insane despair cuts the thread of life with arsenic or with prussic acid, yet many of us take these poisons through the pores of skull and face, ignorant that though the deed be of slow fruition the crime is of equal degree.

SOME OF OUR PUBLIC ENEMIES.

We commit suicide through our ignorance of the defined law of cleanliness that deems clean, pure homes, clean, pure persons, as well as healthy minds, the text of religious inquiry into the means by which every person, and, therefore, the aggregate of persons—which is the community—can prolong life. It is this ignorance, this suicidal ignorance, that decimates the community. I say to you that the grim spectre death is a hypocrite who laughs at our follies. We believe that he is rampant on the battlefield, where his scythe mows down men by the tens of thousands, or in infested cities, where his grim emissaries do similar harm and act as pallbearers to stricken numbers. But, meanwhile, we do not realize that in the aggregate our ignorance of the laws of health and cleanliness does more harm to life than the dread public evils—disease, famine, or whatever else they may be denominated. Our public enemies are impure food, polluted air, impure water, and these enemies come to afflict us, not only through our ignorance, but through the greed and unholy love of gain of our fellow men in the populist communities of the world. That love of gain does wholesale murder as much as if men opposed each other in a hand-to-hand conflict, but with much less justification, if any exists at all; for in the latter we may discover the result of passion that obscures or drowns reason and reduces the combatants for the nonce to the low level of beasts; but in the former there is deliberation, malice aforethought and cold, heartless calculation to draw wealth from death and gold from the grave. The highest penalty should be inflicted on they who for love of wealth poison the food whereby man lives. It is unfortunate that we have such murderers in our midst. They thrive on the misery their dread acts produce; they reduce the public health, increase the mortality by their nefarious practices; they sell milk from diseased cows; they sell unwholesome tainted meat; they mix flour with impure substances; they send decayed vegetables into the homes of our poor;

they trade diseased poultry for good money; they build homes on sand foundations; they sell poisonous nostrums to the foolish, who believe that every quack can bring them health; they do murder in a hundred ways, and not only that, the community is as yet uncertain as to the extent of the crime, and our Supervisors gave but a reluctant consent to a brief, but courageous, war against such evil, compared to which the moral evils that infest our community are as pygmies compared to cloud-reaching giants.

Have we no obligations in respect to such evil? Shall we not defend ourselves? Shall we close our eyes to the danger and only open them when it has reached our own doors? Shall we decline to interfere because we are not yet stricken, or because we have the means to avoid the danger?

Friends, these are our private and public enemies. Take notice of them. Our private enemies have not overtaken us; their authority cannot reach us, and the moral law avenges itself, but as regards our public enemy, the creation of a competent and intelligent authority cannot only reduce, but drive them out of existence. Such an authority is a public self-defense. It is our fortune to bar enemies from without or within, for we, on this peninsula of the Golden Gate, are so situated that without caution we may fall victims even to foreign invaders of our health.

The main duty of an intelligent community is to surround itself with such safeguards as will result in the reduction of the mortality of its citizens, and a corresponding increase in the average duration of life.

We are told that during the reign of Queen Elizabeth, the death rate in London was 40.01 in the thousand. At that time, now more than three hundred years ago, the population of the English metropolis could not have exceeded half a million. At the beginning of Queen Victoria's reign, sixty years ago, the rate of mortality was 24.01 in the thousand, and is now reduced to 19.01, which makes England the healthiest country in the world. These simple figures tell a story that every community ought to know. They mean that a proper supervision of health, a proper inspection of the sanitary systems, organized to examine into food, and proper vigorous development and conservation of the physical forces of the citizens and their children must necessarily tend to arrest the processes of disease, the increase of premature death, and must promote the longevity of the people. And if London, the heart of the world, can so prosper, every other community can likewise. London and

its suburbs have now five millions of people. In the heart of the old city people live so packed together that the public health officials are compelled to measure out the number of cubic feet of air indespensable to any single person. Thousands live in squalor, in poverty, lacking wholesome food, and are given to stupifying drinks, and are neglectful of their persons; thousands are so poor that they subsist only on the rejected food of the better classes. Thousands are so miserable that they lack the common necessaries of life.

Under such depressing circumstances it requires the greatest public care, the most expert knowledge of sanitation to keep out disease. Disease reaps its dreadful harvest in large cities. Infection runs like wildfire from house to house, or, like the angel of death in Egypt, passes the threshold of the elect only: and yet, London is the healthiest city in Europe. Why? Because its authorities felt the deep responsibility of caring for this mass of humanity, from the midst of which might grow out destruction and death to every home of the kingdom. This care expresses itself in many ways. One of these ways is called inspection. Citizens, rich or poor, must submit to a system of supervision that demands obedience to general laws of health and cleanliness. That system in its manifold ramifications inspects everything: the home itself, its sanitary condition; the health of its inmates, the food they absorb, and everything pertaining to their health and cleanliness.

WHERE RICH AND POOR ARE EQUAL.

Sir John Simon, the eminent statistician, says, correctly: "It cannot be too loudly proclaimed that efficient administration of sanitary laws is among the best helps that can be given to the poorer classes of the population, and those authorities who negligently fail of their duties in such administration are among the worst oppressors of the poor."

This applies not to London only, but to every great city, to every center of population. Proper inspection, proper administration of sanitary laws insures longevity.

Surgeon-General Sternberg says that "It is well known to the health officials that the mortality from preventible disease is greater than that caused by cholera or yellow fever in countries where these diseases prevail habitually."

Probably the best illustration of the excellence of sanitation is in the South. You know how dreadfully our fair Southern cities were

periodically afflicted with yellow fever. Since 1878, eighteen years ago, not a trace of the yellow fever itself has been experienced, because the citizens have become alive to the fact that this terrible scourge can be kept beyond the confines of our land by a proper administration of sanitary laws, by exclusion from without of anything that may have been in contact with the plague, and by a due observance of the laws of personal cleanliness and diet, as well as by a rigid inspection of the sanitary condition of cities and communities, and every home therein.

Chicago is one of the most healthful cities in the world, with a death rate of but nineteen in the thousand, because its sanitary administration is said to be the best in the world. And New York, with its congested districts of unfed and sweltering people, would be a hotbed of disease were it not for its magnificent system of inspection and sanitation. With such virtuous examples before us, what may be our duty?

THE GOOD WORK SHOULD NOT STOP.

It appears that our first duty lies in upholding the important position of our Board of Health, and in strengthening their hands to the end that they may introduce in our city every matter that has by experience conduced to the health of communities elsewhere. A gallant fight has been made by them, not only for the introduction of proper inspection of milk, but of other food and drink; but the good work surely should not end there. Our city is, virtually speaking, open to the four winds of heaven. It is as essential, as I said at the outset that we should defend ourselves against the enemies of health as against the enemies of our peace. An armed fleet entering the Golden Gate to reduce this free American city to ruin cannot do us as much harm as a lax quarantine system, whereby the plagues from the East may be introduced as they were introduced in 1849, and inflict damage upon us that cannot be calculated in money. A bombardment of the city may reduce our homes and churches to ruins, but they can be restored. Life itself never comes back again, and if any graves would be opened in this community as the result of negligent supervision of our port of entry or careless defense of our rights in this matter, a serious responsibility would rest upon our Supervisors, as well as upon all who have the care of the citizens entrusted to them. It seems not only right, but dutiful, that the citizens should exercise at least as intelligent care in the appointment of a competent Board of Health

as they do in the election of officers, and it seems advisable that a portion of that enthusiasm that is wasted in political campaigns should be bestowed upon the means whereby the community can remain in the enjoyment of health and vital strength.

Unfortunately we do not always see the necessity of asserting ourselves in matters pertaining to the public defenses, and I say again that this is as important a measure of public defense as any that may come from any possible enemy abroad.

Not to go into the matter any further, the citizens must be convinced that the Board of Health needs the utmost discretionary powers in order that the health of our community may be preserved; in order that imposition be punished; in order that greed be revenged, and in order that a moral tone might prevail that shall at all times protest against the carelessness and the negligence which were so well exposed during the preceding months. With healthy homes, healthy schools, food protected against the criminal love of gain of producers who would dilute or spoil it, we may be able to witness the time when the mortality of our great city shall be still further reduced. For this can be done. We perhaps rely a trifle too much upon our favored location, upon the winds that strike this peninsula and purify the atmosphere; but let it be understood that no favorable location is safe against man's crime, man's ignorance, man's self-deception or man's unhallowed desire to destroy the health of the community for the purpose of gain.

We may hope to see, therefore, not only inspectors of milk, but inspectors of food, of meat, flour, vegetables; inspectors stationed on the four roads leading to the city, inspectors of slaughter-houses, and of bakeries; inspectors of homes as well as of public highways; so that by the aid of intelligent sanitation this great city of San Francisco may fall in line with the great metropolitan cities of the earth in Europe and in America as a splendid example of that municipal care that not only preserves the peace but also the health of its citizens to the end that they may not only be at peace with one another, but live long in the land which the Lord their God has given them.

A MAN recently drank a pint of yeast in mistake for buttermilk. He rose three hours earlier than usual next morning.—"Tid-Bits."

MENTAL FATIGUE IN SCHOOLS.*

For several years the subject of mental fatigue in secondary schools in Germany has been discussed with much show of ardor, and school authorities in that country have frequently been assailed for expecting too much work of the juvenile brain. Representatives of the science of hygiene, feeling themselves called upon to substantiate these charges, subjected some schools to a rigid test. Leo Burgerstein, of Vienna, and others, notably Professor Hoepfner, of Berlin, were successful in presenting statistical results which were in every way reliable, because scientifically obtained and tabulated. Professor Burgerstein presented his results in the form of a diagram, called the "fatigue curve," before a meeting of the Society of Hygiene in London (1892), and at other places; and Hoepfner published in 1893 a little book in which he presented the results arrived at accompanied with very impressive language. Both gentlemen are practical school men; and their words and figures made a deep impression. Later Professor Kraepelin published a work on the "Limits of mental capacity in youth" (1894), in which he made use of the before mentioned tests, and added others, reviewing the question with great erudition from a physiological and psychological standpoint. This attempt to substantiate the statement that the German high schools, both classical and modern, make demands upon the mind which youth cannot live up to without serious injury to health, has naturally created an opposition which deserves to be heard, inasmuch as overpressure has often been said to exist when on various occasions comparisons were instituted in this country between German and American schools. Dr. Gustav Richter, a man of great erudition and practical experience, gives voice to the opposition in an article published under the caption "Instruction and mental fatigue" in "Lehrproben and Lehrgange," Halle, Germany. His arguments are the more acceptable since they are advanced with candor and laudable impartiality. An extract from his article is here inserted. Dr. Richter says :

* Abstract from Report of William T. Harris, Ph.D., LL.D., Commissioner of Education.

The opponents of our present school system, ever since Lorinser's famous book appeared, have used the catchword "mental fatigue" as a weighty argument against the organization of the entire system of secondary schools. In numerous pamphlets caused by the fierce educational struggle raging in Germany, evidences for and against this assumed fact have been furnished, and new material, statistical and otherwise, has been published which urged school authorities everywhere to counteract by real or assumed improvements and revisions of the courses of study, the dangerous excess of demands upon the youthful brain. Nevertheless, a solution of the burning question has not yet been reached.

No investigator has been able to state the laws of mental growth in the age of development other than in general lines; nor has anyone been able so clearly and distinctly to define the beginning of fatigue and the statics of mental capacity for the different steps of the juvenile period of development so that schools could derive from them useful regulations for the minutiae of practical work. In reply to Preyer's essay on "Natural Science and School" I have emphasized that no single professional science as such can have the privilege of determining aims and methods of school education, but that only to pedagogy can be given the right to do that, it being the general science of education. But I have acknowledged that pedagogy must listen to other sciences and use them as supplementary sciences. With reference to natural sciences, I said: "They must state the amount of elementary knowledge from the various fields of science necessary for general foundation of higher study. This is a task which, though it may seem simple, is by no means accomplished with unanimity by the representatives of higher education. Second, natural science must give us the conditions and laws of physical development, and, as far as is possible in connection with that, also of psychical development. From this may be derived the right to supervise the schools from a medical standpoint, and to examine with reference to hygiene the buildings and everything pertaining to them."

The first of these two tasks Lothar Meyer has earnestly tried to perform. The second task has recently been tried by Emil Kraepelin, professor of psychiatry in Heidelberg. His work, entitled "Concerning Mental Labor" (Jena, G. Fischer, 1894), is an eminently useful one, because in place of glittering generalities, such as "excessive demands upon the gray substance of the young brain," and "excessive accumulation of knowledge in the undeveloped brain," he offers scientifically gathered facts which represent tests and observations beyond criticism. And yet his conclusions are wrong. How that is possible will be seen if we review his work from the standpoint of experience.

He first investigates the limits of mental capacity in youth. School (he says) makes daily demands for a certain measure of brain work without being convinced that the juvenile brain is able to perform such work without serious injury. We send the ship

out upon the open sea without a trial trip, that is to say, without knowing whether it will be seaworthy. In order to obtain reliable information concerning this we must examine the conditions of fatigue in children.

The author starts out with the tests made with adults. He says:

That which we can determine with great accuracy is the working power of the individual in simple mental performances. To measure them we may utilize a number of small tasks of equal difficulty, and problems to be solved within a given time, as, for instance, counting of letters, reading, memorizing rows of numbers, syllables and words, a continuous adding of simple numbers, and similar work All this work was carefully examined by him, but he only gives us the result obtained in adding numbers. The persons tested were students in the university, assistant professors, young men who were of nearly equal education and age. In exercise books specially prepared for the purpose, the professor made them add without interruption the figures printed. When the sum of one hundred was reached the hundreds were omitted and the addition of units were continued. At intervals of five minutes a signal with the bell was given, and a line was made under the figure added last. When the results were examined, it was found that many numbers in periods of five minutes each person had added. This clearly showed the degree of velocity with which different persons work. This result will be found in every kind of simple action. The difference in individual capacities will plainly show up. This kind of test simply proves the individuality of personal capacity and nothing else.

Common experience has taught us that the performance is greatly influenced by the amount of exercise one has in it. The rapidity in adding will increase with every test, until a certain limit is reached beyond which this velocity cannot be increased by exercise.

The extent of capacity for exercise seems to the author to be a general quality of the individual. He who proves himself very capable in gaining skill in any one field of action is apt to increase his velocity in working in other fields. Whether a similar statement can be made with reference to the power gained by exercise has not been investigated sufficiently, but it may be stated that a skill once obtained is not lost very rapidly. After several months the author plainly noticed the skill gained by the exercises in addition mentioned before, though they had lasted only a few hours.

Professor Kraepelin has also discussed fatigue. According to the views of modern physiology, fatigue is a chemical process in the organic cells. The working muscle secretes waste material, which is poisonous. The stronger the brain activity, the more copious is this secretion of the brain cells. Their environments

are contaminated, the poison gets into the blood and through the circulatory organs it comes in contact with the nerves and cells of other parts of the body. With the aid of oxygen it is consumed in the blood or destroyed by the liver, or discarded through the kidneys. When this decayed matter accumulates in the blood we feel fatigued; if we exceed the physiological limits we become diseased (compare Mosso's "Fatigue"); but there seems to be also psychic factors in the process of fatigue for when a physiological explanation is difficult.

The progressive increase in the capacity for work through exercise is opposed by the effects of fatigue, which progress much faster. Fatigue everywhere causes a decrease in the amount of work performed, although this decrease may be equalized for a time by increasing skill. As soon as fatigue takes the upper hand the capacity for work vanishes quickly and incessantly.

The author further points to the differences in the fatigue limit of individuals and shows that nevertheless all persons, aside from special well-founded irregularities, exhibit in all kinds of work a similar process in harmony with the given individuality; hence arises the fact of the extent of individual endurance. This is the fundamental quality of each individual, and it determines in general the capacity for work.

Aside from the general state as to fatigue, there are other elements that seem to be open to determination by measure. Thus, for instance, the fixation of the degree of diversion to which a person is subject; the elasticity of his capacity for work, that is to say, the power to equalize disturbances; the dependence of mental power of work upon the amount of nourishment, the duration of sleep or physical exertion. Finally, as a supplement to the measurements of velocity, must be considered the investigations concerning the value of work, which will be exceedingly difficult. At any rate the author has demonstrated that it is actually possible "to express important peculiarities of a mental personality in numbers and comparative ratios."

Yet, after all, it appears to me (says Professor Richter) as though in the methods of investigation applied the measurement of the fatigue limit cannot be determined with the same accuracy with which the extent of capacity of exercise or skill can be determined. Mental fatigue is not only dependent upon the performance of work, but also upon accompanying conditions of the emotions. It is a well-known psychological fact that feelings of displeasure will facilitate fatigue, while feelings of pleasure will check it. The inner relation of the individual to the work he is performing is a factor which must be considered in investigating his fatigue limit. The author has not entered into that side of the question, and

hence the results of his investigation cannot have a convincing character. To add continuously for several hours numbers of a single digit is such a tedious work that it generates a feeling of displeasure which will facilitate fatigue and injure the elasticity of the mind. It must be deplored that the persons examined by Professor Kraepelin were only tested with reference to their velocity in working, not to the correctness of their work; only with reference to the extent, not to the value of the work. It is true the mathematical fixing of the part which interest has in the work will meet with insurmountable obstacles. Mental life consists of such complex processes that every attempt at a mechanical explanation must be stamped at once as inadequate. If the author had given to the persons to be examined a number of interesting problems from their own field of labor, which would, of course, have prevented the test in velocity, he would doubtless have come to other results in reference to the phenomena of fatigue. Moreover, the success each person attained would have changed the entire result in many ways.

In discussing the fatigue of school children the author refers to investigations of practical school men, the results of which have been published in recent years. Leo Burgerstein, in Vienna, placed four rows of simple arithmetical problems before the pupils who were familiar with their solution. Each period of ten minutes of written work was followed by a recess of five minutes. These problems or tasks he submitted to 162 children, in the age between 11 and 13, at the beginning of a school day. During the intervals of recess new blanks containing the problems were distributed, and at the tap of the bell the pupils again went to work, and so on through the morning session. The performance was measured with reference to its amount by the number of problems solved in each period of ten minutes, and the value of the performance was measured by the absence of mistakes. He was careful, also, to consider the corrections which the children had made during the work.

The result shows that the number of digits used had increased from period to period, demonstrating thereby a considerable average increase in the velocity of work. This increase, however, was made by only 92 pupils, while 70 lagged behind.

The small increase in the number of errors between groups 3 and 4 is remarkable. It seems as though the children had unconsciously meant to rest in order to start anew in the fourth period. With the rapid increase in the number of errors is noticed an increasing number of corrections. The fewest corrections are made in the third period. Fewer corrections and a greater increase in the number of errors are undoubted evidences of mental fatigue.

The increased velocity is accompanied by an increased number of errors. This, again, is true only with reference to those who progressed rapidly in speed, while those who lagged behind showed relatively fewer errors. The following table shows the general results:

Periods of 10 minutes.	Digits worked with (about).	Number of mistakes.	Mistakes in per cent of digits.	Mistakes in per cent (about).
1	28,200	851	3.01	3
2	32,500	1,292	3.98	4
3	35,400	2,011	5.67	5.7
4	39,500	2,360	5.98	6

Similar observations were made by Hoepfner in Berlin when investigating the work of 9-year-old boys written from dictation. They had been occupied with 19 sentences for nearly two hours, and the work had been careful and slow. In this case, also, the number of errors, which were at first small, increased rapidly toward the end of the work. Computed on the basis of 100 letters, the errors increased from 0.9 to over 6.4 per cent. Kraepelin refers again to the tests in addition to which he had submitted his students and assistant professors, and he states that each thirty minutes of work was followed by a recess of ten minutes It was noticeable that the work after each pause was more rapid than in the preceding period. He explains this fact by the influence which practice has in generating skill, and by the fact that fatigue is counteracted during the pause of rest. Fatigue disappears comparatively quickly, while the gain in skill remains, and can be noticed for a long time after.

From this we may derive a lesson and a valuable principle for practice in the schoolroom; it is that by inserting short pauses between periods of work the power is increased and the destructive effect of fatigue is counteracted; the gain in form of skill is very great, whereas skill might be destroyed if the pauses were not inserted. Hence Kraepelin demands more frequent pauses, and he claims that it would be wise to increase them in length as the school session proceeds.

I shall return to this point; and at present quote the author, who thinks he is accurately sketching the condition of school children during instruction. The picture he presents is, according to his own expression, a frightful one:

Since it is demonstrated (says Kraepelin) that 12-year-old pupils show the first signs of fatigue after a period of ten minutes in simple work, it stands to reason that mental work lasting through several hours, only broken into by brief periods of rest, must inevitably lead to complete mental exhaustion. The intensity of attention demanded is much too great. The pauses of rest are much too short, and a normal capacity for work cannot be maintained

under such circumstances. After the first hour of that kind of work the pupil will be in a narcosis of fatigue which makes him incapable of applying his strength to understand and follow the instruction. It stands to reason that this condition shows variations in different pupils and ages. The younger ones are, as a rule, so tired after the first hour that the powerful influence of exercise and skill gained are not able to counterbalance the progressive decrease in the capacity for work.

Not without amusement one reads what the author adds to this picture in gray upon a gray background: "But I freely confess that the picture is painted in colors too dark. As I have described it, the situation would be correct if school accomplished what it attempts. However, kind nature has given our growing generation a safety valve, the value of which can scarcely be gauged too high; it is that of inattention. Only with force, and even then for a very short period of time, can we succeed in securing the attention of our pupils upon the solution of problems given them. Nowhere is there a school in which a whole session can be considered a session of work. Burgerstein, it is true, believed that the inserted pauses would secure a proper relation between effort and recreation in any regular school hour. Yet his tests prove incontrovertibly that our youth would necessarily incur mental disease if they were forced to work steadily and with intense attention for forty minutes of every hour of the school day. That comparatively few are seriously injured mentally by overexertion in school is owing to those branches, and likewise to those teachers, that give to the pupil the blessed opportunity to loosen the reins of his fatigued attention and to forget himself. "We can force pupils to sit still," says Burgerstein, "but we must not deceive ourselves, for in many cases they will rest mentally or rest by obtaining a change of mental occupation and not follow the course of instruction when they are tired. From this the unexpected conclusion is derived that tedious teachers, so-called preaching-teachers, have become a necessity. If all teachers understood how to awaken intense interest for their subject of instruction and how to keep it awake, the children would, despite rapidly growing fatigue be led to ever increasing efforts, the consequences of which could scarcely be gauged."

So, then, inattentive pupils and tedious teachers are the necessary contrivances to break the speed of the rapidly running school machine. This is a contradiction of ideas that borders on nonsense: A school is the better, the worse it is.

However, joking aside, there is a grain of truth in this paradox. There are teachers who with iron energy hold the attention of their pupils in such tension that for other branches, especially during the lessons immediately following those of the energetic teacher, the pupils are absolutely unfit for work and consider it a blessing when the teacher lays fewer or no claims upon their strength. And among the inadequacy of all human institutions the

school of the future, like the present, will suffer from human imperfection, and will be grateful if nature in her kindness will equalize in her own inimitable way the errors of poor mortals. However, that is neither here nor there. Above all we must find out whether the conclusions of the author are unobjectionable. They start from facts experimentally secured. Have these conclusions convincing power?

We need not appeal to human imperfection. It can be shown that the conclusions of Professor Kraepelin are erroneous, because they start from the wrong premises. If in a pupil 12 years old, after a simple kind of work of barely fifteen minutes' duration, the first signs of fatigue are noticed, a continuation of that work, broken into by brief pauses only, would lead to utter exhaustion. To this conclusion leads the presupposition that a single form of written work entered upon with well-defined intention (for instance, that of examining the mental capacity) may be taken for, or confounded with, the general term instruction. In this lies the key to the erroneous conclusion. The author evidently presupposes that the organization and purpose of school claim that the children be kept at the same tension all through the hours of the school day in which they had been kept during the trial lesson, which consisted of test work and mechanical repetition of processes. If this supposition were correct—that is, if these tests were really a photograph of the general working of school instruction—the author's conclusions might be considered sound, for lessons of that kind have all the characteristics the uniform effect of which is a deadening pressure upon the juvenile brain. Let us try to define these characteristics.

It is plain, first, that test work such as was described will hold the thoughts of the pupil exactly in one direction. The same nerve currents, the same ganglia cells are kept in uninterrupted activity. This is the cause why nothing is so fatiguing as uniform mental exertion. Second, such work forces all the pupils simultaneously to the same degree of exertion. The pressure is a constant one, acting upon all alike. Finally, the work obliges the pupils, during the entire time it takes to perform it, to a certain position of the body, which increases fatigue. It is quite obvious that the enforced uniform position of the body necessitates one-sided exertion of certain groups of muscles, while others are kept idle. Feelings of displeasure are generated thereby, which check the activity of the brain.

However, the real average condition of the process of teaching and learning in school, if conducted by a reasonable teacher, is very different. Certainly school demands the attention and participation of the pupil during the whole school day. But as the direction of the instruction within each branch changes frequently, the degree of mental tension it claims for the pupil's activity varies greatly.

Burgerstein makes the same mistake with reference to his test

work when he says: "During the time of instruction every participant should, as it was done here, be occupied constantly."

Professor Uhlig, in reviewing Kraepelin's volume, remarks: "I do not in the least doubt the exactness of these tests, but I claim that it is erroneous to draw the conclusions which the author publishes, for these experiments placed the children before a whole series of tasks in the same field of action, the doing of which required a specially high degree of attention. Now, it would be erroneous to asert that the practice in school throughout is analogous to this procedure, or that it should be analogous. If every lesson of the day should demand so high a degree of tension as these test lessons did, school, as it is now conducted, would be subject to the accusation of the most frightful waste of time. No school works constantly in the manner indicated."

The beneficial influence of change upon mental activity is a fact to which the school pays a good deal of attention, both with reference to the order in which the branches follow in the time-table and with reference to the method of teaching within each single lesson. Every instruction following correct methodical principles will show variations in the mental tension demanded of the pupil, according to the amount of self-activity or passive acceptance of knowledge required. There is also a variation of the mental activity depended upon or caused by the different objects in view; that is to say, whether lessons are given in which natural objects are viewed or accomplishments—such as drawing, singing, writing, and the like—are practiced, or whether intense thinking is required, as in arithmetic. It can not be tolerated to occupy the children with grammar or mental arithmetic for hours at a time. A teacher who does such a thing is breeding mischief and should be severely reprimanded.

Every lesson in itself offers a great many opportunities for change in mental activity. The processes of apperception and abstraction, exercise and application of which each claims a different psychical activity, change places very frequently. It is well to emphasize this. In language lessons a poem or a piece in the reader is treated. First, a brief review is held by appropriate questions; then the piece is explained with reference to contents and form. The progress of the action or the development of the thought is followed. Finally comes the exercise in expressive reading. The different psychical actions are alternately at work. Now it is judgment, another time it is the power of apperception, and again it may be a play of emotions. This constant change prevents fatigue.

During a lesson in foreign languages translation from and into the language takes place; sentences and paragraphs are read; the linguistic form is analyzed; the thought is fixed; the recasting of a thought in the other language is attempted; contents are explained; grammatical exercises take place, alternating with forming and re-forming of sentences; the etymology is studied, and the

practice of rules takes place, etc. All these things cause constant changes in the mental activity of the pupil, which prevent fatigue. History, geography, and nature studies offer the greatest variety, both with reference to the matter and method. Even abstract mathematics claims a variety of changes by seeking points of contact with sense perception, and hence permits many pauses of rest from mental tension. Moreover, there are various modes of presenting and solving problems, all of which cause variety.

It is admitted that the pupil cannot be spared earnest mental work; but that it should be in the nature of our educational aim that its work must necessarily lead to exhaustion can be positively denied. Sound common sense and the rules of didactics protect the pupil sufficiently. Herbart says: "When the pupil is really fatigued by, not merely being displeased with, certain subjects it is well, as far as possible, to let this feeling subside or be counteracted before the same subjects are taken up again in a somewhat different form." Mosso expresses himself in a similar manner, saying: "The best teachers are those who never overexert one region of the brain of their pupils and who understand the art of attracting the attention, now here, now there, so that it may after awhile with new vigor return to the subject at issue."

Upon such application of method depends the refreshing, revivifying effect of good school instruction. There is recreation in change. If proper pauses for rest are arranged, and if these pauses are spent in the open air, while the schoolrooms are thoroughly aired by opening the windows, and if gymnastics and games are provided for, I really do not know what more could be offered to the growing generation both in regard to physical and mental development. Fatigue taking place after protracted tension can be removed by the two chief remedies which are found in change in occupation and complete recreation. This balance would be much more effective if school had only to deal with healthy children; but we must consider the many weak children who suffer from poverty of the blood and who do not during their school years receive proper nourishment, nor get sufficient sleep, nor enough of other important agencies for hygienic development. It can not be doubted that the school in many cases remedies the errors made at home. The healthful discipline which accustoms the children to regular mental activity, the proper change between work and recreation, the habitation in well aired and lighted rooms, bodily exercise and movement by means of gymnastics and play, as well as in school excursions, a habit acquired in obedience, order, punctuality, and cleanliness are for many children a deliverance from destruction and ruin.

Professor Richter then goes on to quote figures obtained from test work to which the pupils of the gymnasium in Jena were subjected; they are very interesting, and their value is great owing to the scientific method pursued in obtaining the results; but they

are omitted here because they essentially repeat what has been said before.

A few words concerning hygienic school statistics may conclude the chapter. Prof. Otto Jager, in Cologne, in reviewing Kraepelin's and Erb's books, says, that in an experience of forty years both in small and extensive educational institutions he had very rarely found nervousness among the school diseases. He could, if called upon, draw up a counter-bill of cases in which the nervous system of spoiled mother's sons had greatly improved as soon as they had been required to live a regular school life. "Say what you will, and take it all in all, the life within a large public school is on an average a very healthy life."

The drawing up of such an account, to which doubtless other educators could add contributions, would be a very meritorious undertaking The observations made on nervous children would be supported by numbers far inferior to those of healthy children. It is true, we have not as yet a thorough science of school statistics, but various attempts may be quoted. Prof. Axel Key, of Stockholm, states in his school-hygienic investigations (1889) that in Sweden the children in the upper grades of the common school had fourteen hours of daily work. Thirty-six per cent. of the girls are chlorotic, and about 10 per cent. of them suffer from spinal curvature. Aside from nearsightedness he found in the schools of Sweden and Denmark that nearly 40 per cent. of the children suffered from chronic diseases. This exhaustion and wasting away of strength among the children he ascribes to overtaxing, to the enormous amount of school tasks with which they are burdened. The school physician and professor of hygiene in Budapest, Dr. Heinrich Schuschny, says in a recently published pamphet entitled "Concerning the nervosity of school children," that in a certain institution which he names, 46.4 per cent. of the pupils in the four lower grades suffered from symptoms of nervousness, and that this proportion rose to 57 per cent. in the four upper grades. Still more unfavorable is the result of the observations of Professor Nesteroff, in Moscow, who for four years observed 216 students of the gymnasium of that city. He noticed that the proportion of pupils suffering from nervous ailments rose from 8 per cent. in the preparatory grades to 67 per cent. in the highest of eight grades.

Now, how shall such figures be judged? A few hints are given us by Professor Schuschny. A great proportion of the pupils ex-

amined belonged to the Jewish population, who, according to the author and the verdict of medical specialists, are overburdened and oppressed. I cannot judge whether this is true, but from further explanations of the author I judge that a large number of these pupils belonged to the poorer strata, who are early in life forced into occupations for the purpose of winning their daily bread.

Often the pupils could only make their attendance in school possible by giving private lessons to little boys; several of them had to support parents. There are in our school students who give private lessons for three or four hours a day; others are obliged to help their parents in stores and shops; one student has to rise at 4.30 o'clock in the morning in order to aid his uncle.

Another hint refers to the intimate relation between the use of stimulants and nervousness.

Of our students 47.7 per cent. use alcoholic beverages at home, mostly wine. I found that the greater number of these students suffered from nervous symptoms. Their proportion to those students who use alcoholic beverages but do not suffer from nervous symptoms is 56.8 to 43.1 per cent., an obvious proof of the influence of alcohol upon the nervous system.

It is to be regretted that a statement concerning the amount of alcoholic beverages consumed at home cannot be taken into consideration. It would likewise be important to obtain statistics on the influence of nicotine upon the nervous system of schoolboys. I can bear witness to that influence by stating that a senior student twice declared that he had been obliged to be absent from school because he had temporarily poisoned himself with nicotine through cigarette smoking. Investigation at home proved the correctness of the statement, and the advice given to the parents, either to forbid or to limit the enjoyment of cigarettes (the school as such can only forbid smoking in public), was successful only in one of the two cases. Schuschny inquired into the duration of sleep of his pupils, and found that among nervous children it was too short. He does not mention the nature and quantity of their food, although concerning this point very interesting facts might be gathered. The time after school hours and on holidays is not spent in the most advantageous way.

Is there to-day a pupil of a high school who has not at least once in his life seen a Parisian drama on the stage in which adultery is the chief motive, and then think of the books and modern newspapers. Very few parents attend to the physical development of their children; few ever take their children out for a walk in the

open air and into the woods. A diminishingly small fraction of our school boys and girls make use of the skating pond in winter or the swimming school in summer.

I have quoted these statements of Schuschny's, although they have no reference to German conditions, in order to indicate what difficulties are in the way of a proper estimate of statistical material; and what a want of logic it betrays if physical disturbances in children are without hesitancy attributed to the influence of school life. Mosso declares this in his investigations as an absolutely insurmountable difficulty, so that we cannot say how many of the boys might be healthy and how many might be ill, if they did not go to school at all.

Schuschny mentions, among the causes of overtaxing, the fact that in Hungarian secondary schools the departmental system of teaching is in general vogue. According to this every branch of instruction is assigned to a specialist, hence in a school of nine grades we may find as many as 11 teachers changing places within a single school day in a single class room. The physician makes some very pointed remarks concerning this.

This system frustrates the educative efforts of school. In Germany every teacher has to teach a group or relative branches, and in every room a class teacher, who has charge of the discipline and attendance roll, has the largest number of hours per week to teach in that class room. In Bavaria the class teacher teaches everything save mathematics and natural science. To the class teacher is assigned the duty of keeping in constant contact with his colaborers, so as to secure an organic unity of class instruction and prevent the accumulation of home lessons. Specialists always have the aspiration to magnify their branches and demand a degree of attention and interest which cannot be maintained uniformly all through the day unless a class teacher restricts these demands to their proper limits.

In regard to this system we have no statistics, and all our arguments are based on individual experience, the whole tenor of which, however, is so obviously convincing that there can be no doubt as to one thing, namely, that the system of specializing will foster special talents in a few robust thinkers and mentally dwarf the great majority of average talents.

The introduction of well planned and regularly compiled school hygienic statistics is not only desirable, but a requisite of the school of the future. The science of statistics thus properly sup-

plemented will, to a more satisfactory degree than hitherto, influence the various conditions of the growing generation. It will investigate the physical status of the pupils, and thus offer the material for investigation concerning the reciprocal relation of life in school and life in the family. Not until then will the troblesome question of overtaxing the brain be solved in a scientific way. Any State that would begin with obtaining such statistics would deserve great credit. I suggest a few important points: The Government should appoint a commission consisting of physicians and educators and assisted by executive officers. In this commission should be an expert in hygiene and psychiatry (if possible, he should be a university professor), several practical educators, and the State school commissioner—the latter should be the president. This commission should be charged with preparing schedules of inquiry, formulas, and blanks to be filled out. The statistical data gained from these local census returns would have to be not only counted, but also weighed in the light of (*a*) the climatic and geographic location of the city; (*b*) the architecture of the schoolhouse, together with its hygienic condition; (*c*) attendance; (*d*) the number of hours per day and week, recesses, and other things. The foundation of hygienic statistics would be the medical examination of all pupils at the time of their admission to the school. These data should remain in the hands of a physician, and should have reference to weight, size, digestion, pulse curve, blood pressure, diseases passed through, abnormalities, and similar things, about which a professional man can best judge. George Hirth remarks justly that it is a mistake to merely give the age of pupils and not also their condition of health medically certified. For newly admitted children a record should be established, and at least an annual examination should take place, which would periodically add items, and thus show a rate of progress or deterioration. Side by side with these general data each pupil should have a column of his own in the record, which might contain items concerning his nourishment, sleep, condition of place for work and for sleep; that is to say, the amount of light, heat, etc. And it would seem very desirable to note down in what manner the children fill out the pauses between lessons and sessions. Not until a uniformity of execution of such statistical investigations is secured will it be possible to judge properly the question of physical and mental development of youth; and not until then shall we be able to decide the weighty question of overtaxing the brain.

Some may say that these are plans for the millenium. That may be, but if only a few States, small though they be, carry these plans into execution, their results will give a standard measure for other schools and countries. The German nation has at all times had the duty of performing mental work to a higher degree than others, being, as it were, placed in the geographical centre of a continent and endangered from all sides, and having to undergo a competitive struggle with all the nations of the civilized world. Without great effort in mental labor youth cannot be instructed successfully, and certainly cannot be accustomed to prolonged effort unless it is done while the natural powers are still plastic. By lowering the demands and yielding to the complaints of weaklings the process of degeneration will be accelerated and the whole nation will gradually sink to a lower level of culture.

One thing is plain without any statistics. The more readily the life of the nation and the customs of the people return to simplicity, modesty, and inner health the easier it will be for the school to train a healthy race. And again, only when the trainers of the youth are what the young generation is to be will their work be successful. Now, the trainers of youth, however, are not merely the teachers in school, but every one whose example is before the youthful eye, and chief among them that of the parents. Hence every one must begin with himself. Self-control and self education of the adult are the best discipline of youth. If we only preach and leave to others to do the work, we shall not succeed in warding off the beginning of degeneration, unless frightful catastrophes come to our aid.

CONTRIBUTORY NEGLIGENCE.—He put on the shoes and he wore the shoes *on purpose;* that is what Freeman O. Smith, of Baltimore, did. Anything that is done on purpose is done designedly, and whatever is done with design is not done accidentally. The logic is inevitable; any justice of the peace ought to see that. Freeman's sore toe was the result of design and not of accident. Then the matter of contributory negligence comes up for consideration. When Smith's toe began to be sore why did not he put off the tight shoes? Why persist in doing that which finally resulted in death? But he did persist, and the fatality was started by him with deliberate design and persisted in through his own negligence to an extent that made him the cause of his own disaster. We trust the company will appeal from the Ohio decision.—"Insurance Monitor."

A MAID'S A MAID FOR A' THAT.*

BY MOTELL WHITNEY.

Is there for honest womanhood,
That hangs her head and a' that,
The modest maid, we pass her by,
Who dares be true for a' that.
For a' that, and a' that,
Her toils obscure and a' that;
Her sphere is but an humble one,
The maid's a maid for a' that.

What tho' on frugal fare she dine,
Wear simple garb and a' that—
Give fools their silks and knaves their wine:
The maid's a maid for a' that.
For a' that, and a' that,
Her lowly birth and a' that;
The honest maid, though e'er so poor,
Is queen o' maids for a' that.

Her lips are like the crimson rose,
Her cheeks are fair, and a' that;
Unclasped and free her lovely waist,
Her limbs are strong, and a' that.
And a' that, and a' that,
Her sparkling eye, and a' that;
The man of understanding mind,
He likes the maid for a' that.

See yonder frail and slender maid,
That struts and stares and a' that;
Though hundreds envy her display,
She's but a toy for a' that.
For a' that, and a' that,
Her tinsel show, and a' that;
The man on health and vigor bent,
He looks and laughs at a' that.

*A new version of "A Man's a Man for a' That," suggested by the too prevalent notion among young women that physical frailty is a thing to be proud of.

Her puny form and feeble limbs,
  Her taper waist and a' that;
A shallow mind you're sure to find,
  A faithless heart and a' that.
And a' that, and a' that,
  A putty face and a' that,
Though gaily frilled and furbelowed,
  She's dunce of maids for a' that.

Then let us pray that come it may,
  And come it will for a' that,
That health and worth o'er all the earth
  Shall bear the prize and a' that.
And a' that, and a' that,
  It's coming yet for a' that;
That health and strength the world o'er,
  Shall bear the palm and a' that.

THE LONGEVITY OF THE QUAKERS has been well known and frequently commented upon, but we have never, until recently, seen figures which appear to demonstrate that they live about twice as long as ordinary men! We give the figures below just as they are printed in the "Policyholder," Manchester, England, but it seems incredible that they should be correct. Heretofore "a generation" has been estimated at about thirty-three years, while under modern sanitary influences it is now perhaps thirty-five years, but the Quaker, according to these figures, lives about sixty years in Great Britain and Ireland, and he is so good a citizen that we wish the same might be true of him in America, and we will be greatly pleased to publish figures demonstrative of that fact. Our contemporary's remarks are as follows:

"The proverbial longevity of the Society of Friends seems to be fully established, to judge by the return for the last three years issued by the 'Annual Monitor.' The average age at death of all members who died in Great Britain and Ireland between the ages of 1 and 101 was, in 1893-4, 61 years, 5 months and 22 days. During the succeeding twelve months the mean age at death had fallen to 57 years, 11 months and 18 days, and in 1895-6 it rose again to 60 years, 6 months and 19 days. This may be but a short statement of fact, yet it signifies a long list of virtues."—"Insurance Monitor," Feb., 1897.

TOPOGRAPHY, CLIMATE AND MINERAL SPRINGS OF MISSISSIPPI.

By A. N. Bell, A.M., M.D.

Mississippi, a southwestern state, lying in the Mississippi valley, is bounded on the west by the Mississippi and Pearl rivers, the former separating it from Arkansas and Louisiana, and the latter from eastern Louisiana; on the east the boundary is, for a short distance, the Tennessee river, and thence a line extending from the point of junction of Bear Creek with the Tennessee river to about 31° 51′ north latitude, and thence due south to the Gulf of Mexico. The 35th parallel of north latitude separates it from Tennessee; and for 108 miles the 31st degree forms the boundary on the south, leaving to the eastward a strip of territory 78 miles broad, stretching down to the Gulf and Mississippi Sound and including all the islands within six leagues of the shore line. Thus bounded and embraced between 30° 10′ and 35° north latitude and the meridians of 88° 06′ and 91° 40′ west of Greenwich, with an extreme length of 330 miles from north to south, and of greatest width from east to west of 186 miles, Mississippi has an area of 47,156 square miles.

From the northeast corner, where there is a marked limestone formation with a rugged country, the surface slopes gradually, with many undulations toward the Mississippi river, and southward to the Gulf of Mexico, leaving a broad and slightly elevated central region extending nearly north and south through the state, which divides the waters which fall into the Mississippi from the affluents of the Tombigbee, Pearl and Pascagoula rivers. On the west this broad ridge extends at Vicksburg to the Mississippi, terminating in bold high bluffs. To the east of this watershed are broad tracts of gently-rolling prairies of exceeding fertility, yielding large crops of cotton and corn, while to the west the surface is broken by valleys and low, narrow ridges that start at right angles from the spinal ridge and terminate at the basin of the Yazoo delta—a basin embracing about 4,000,000 acres, the heart of the cotton zone.

The central ridge is composed of large tracts of rolling, arable land, either in cultivation or covered by heavy forests, the soil, for the most part, a rich, light loam, where not denuded, as it is to

some extent, down to the clay, in which case the soil is sterile. About Pontotoc there is considerable fair upland. In the south stretches a rolling region of open pine woods down to the Gulf shore—a sparsely settled tract, the soil poor but favorable for pasturage, with abundant timber and turpentine-yielding forest.

Thus the larger part of the state has a broken, rolling surface, but nowhere mountainous, or with ridges at the highest of more than 800 feet—none of which are due to upheaval, but all to denudation by the action of water—nowhere other than mere hillocks of sand, clay and drift, whose elevations for the most part range between 30 and 120 feet, with only occasional instances of 300 to 400 feet.

Some of these higher hills skirt the Mississippi river in the southwest and some are above the head-waters of the Pearl river. The Yazoo basin is subject to overflow at times of extreme high water, with the exception of about 200,000 acres in flat ridges, which rise here and there slightly above the general level of the delta that was once the bed of the Mississippi. The northern upland section is diversified by small valley-areas of highly productive soil. In the south the soil for the greater part is indifferent.

The drainage of the state is mainly effected by the Mississippi river and its affluents—the Homochitto, Big Black, Yazoo and its tributaries, the Sunflower and Tallahatchie; the Pearl river, with its principal branch, the Bogue Chitto, and the Pascagoula, with the Chickasawha and other tributaries drain the southeastern portion, and the Tombigbee and its affluents drain the eastern. In the extreme northeast the Tennessee river forms the boundary for fifteen miles, and several small streams falling into it serve to drain that section.

The State has a coast line of 88 miles on the Gulf, and including the islands which help to form Mississippi sound, about 280 miles.

THE CLIMATE in the summer is long and hot, but away from the low, dank bottom lands of the water-courses is generally healthful. The winters are comparatively short, damp and somewhat colder than in the same latitude on the Atlantic coast. But except in the lowlands designated, from October to June the climate is exceptionally equable, temperate and agreeable.

The state is rarely subject to the drenching rains common to lower Louisiana and Florida. The rainfall at and near the coast averages 64 inches, in other sections about 44 inches, and is so distributed throughout the year as to be most favorable to agri-

culture. Extended drouths are rare. The isothermal line of 60° mean annual temperature passes a little north of Jackson, the state capital, but at the coast is 70°. Observations at Vicksburg (32° 23′ N. lat.) for a series of years gave a mean temperature of 65° 25′, the coldest days observed for the same period 42° to 43°, and the hottest 82° to 85°. Natchez (32° N. lat.) has a mean winter temperature (January) of 52.2°, and for July of 81.3°, or nearly the same temperature for those periods as Cairo in Egypt.

The bluff shore of the Gulf and Mississippi sound, along which are situated Biloxi, Pascagoula, Pass Christian and Bay St. Louis, is deservedly noted for its healthfulness, and has long been a favorite southern resort for health and pleasure. And some of the islands off this shore are susceptible of being most desirable sanitaria for invalids requiring a soft and temperate atmosphere entirely free from any source of contamination.

THE MINERAL SPRINGS of the State are numerous and some of them of high repute for their salubrious surroundings and the efficacy of their waters in the treatment of disease, but, unfortunately, these conditions have not been taken advantage of as they should have been by local improvements.

Notably, Cooper's Well: the country roundabout is broken and hilly and remarkable for salubrity. The well is sunk in solid sandstone rock to the depth of 107 feet. The water is said to flow in at the bottom from three different sources,* but evidence of this is wanting. The temperature of the water is 64°; the air, in summer, about 80° F. A remarkable case is reported, in the work referred to, by J. Maron (Marion ?) Sims, of chronic diarrhoea in its worst form—extreme emaciation, dry skin, sunken eyes, ghastly expression, frequent and copious dejections—cured by eight weeks' residence and the use of the waters. Began by taking a wineglassful of the water four times a day, gradually increasing until he drank a pint in the course of the day. Ocean Springs are also delightfully situated among the pine hills, about five miles from Biloxi and half a mile from the eastern shore of Biloxi Bay—the most celebrated and picturesque portion of the Gulf shore. The late Dr. Wm. G. Austin, of New Orleans, urgently commended a resort to their locality and the use of the water, as the most efficacious treatment of dyspepsia and strumous affections.

The analyses of these and others are as follows:

Cooper's Well (artesian), four miles from Raymond, Hinds County. J. Lawrence Smith, analyst.

* Mineral Springs of the United States and Canada. By John Bell.

Calcareous, Saline.

Sodium sulphate	grains	per gallon.	11.71
Potassium sulphate	"	"	0.61
Calcium sulphate	"	"	32.13
Aluminium sulphate	"	"	6.12
Magnesium sulphate	"	"	23.28
Sodium chloride	"	"	8.36
Iron peroxide	"	"	3.36
Crenate of lime	"	"	0.31
Crenate of silica (?)	"	"	1.80
Total			95.48

Godbold Mineral Well, near Summit, Pike County. J. H. Laster, analyst.

Chalybeate.

Iron protochloride	grains	per gallon.	11.42
Sodium chloride	"	"	1.73
Sodium sulphate, calcium sulphate, silica.	"	"	Traces.
Loss	"	"	0.84
Total			13.99

Stafford Mineral Springs, on the line of the Queen and Crescent Railway, one and a half miles south of Vosburg. A. L. Metz, M. D., analyst.

Calcareous saline.
(As advertised.)

New Orleans, August 5th, 1892.

The Stafford Mineral Springs Co., Ltd., New Orleans, La.:

Gentlemen—The samples of Water marked "Stafford Mineral Springs Water," submitted to me for analysis, contain in one U. S. Gallon of 231 cubic inches:

Sodium chloride	0.9607
Sodium carbonate	0.416
Potassium sulphate	0.982
Magnesium bicarbonate	0.978
Calcium bicarbonate	13.695
Calcium sulphate	0.561
Ferrous (iron) bicarbonate	0.241
Alumina	Trace.
Silica	1.992
Organic matter	None.

A. L. METZ, M. D.,
Chemist for City of New Orleans and Board of Health, State of Louisiana.

Ocean Springs, Ocean Springs, Jackson County. J. Lawrence Smith, analyst.

Saline.

Sodium chloride	grains per gallon.		47.77
Calcium chloride	"	"	3.88
Magnesium chloride	"	"	4.97
Ferrous oxide	"	"	4.71
Potassium chloride, ammonia, iodine, organic matter			Traces.
Total			61.38

Gases.	Cubic inches.
Sulphuretted hydrogen	1.28
Carbonic acid uncombined	9.76

Lauderdale Springs, near Lauderdale Station, Lauderdale County. L. Harper, analyst.

Indifferent.

Silica	parts in 100.		0.00100
Alumina	"	"	0.00005
Iron peroxide	"	"	0.00047
Limes	"	"	0.00014
Sulphur combined with hydrogen	"	"	0.00034
Potash	"	"	0.00012
Soda	"	"	0.00226
Sulphuric acid	"	"	0.00008
Carbonic acid	"	"	0.00007
Chlorine	"	"	0.00062
Iodine	"	"	0.00006
Apocrenic acid	"	"	0.00008
Crenic acid	"	"	0.00002
Hydrogen combined sulphate	"	"	0.00002
Ammonia, magnesia, bromine	"	"	Traces.
Total			0.00533

Gases.	Cubic inches.
Sulphuretted hydrogen	0.23397
Carbonic acid uncombined	0.25766
Oxygen and hydrogen	0.25728
Carburetted hydrogen	Trace.
Total	0.74891

Springs with no published analysis:

"Akaline Spring":

One mile east of Yazoo City, Yazoo County.

"Alum Springs":

In Lafayette County.

In Madison County.

In Marion County.

In Pike County.

Chalybeate Springs:

Near Poplar Springs, Calhoun County.
Southeast of De Soto, Clarke County.
Near Enterprise, Clarke County.
Near Fulton, Itawamba County.
Southeast of Fulton, Itawamba County.
Near Eureka Springs, Panola County.
Near Warren's Mill, on Mackay's Creek, Tishomingo County.
In Winston County.
In Yolobusha County.
In Tishomingo County.
North of Houston, Chickasaw County.
Near Jonesboro, Tippah County.
Six miles northwest of Ripley, Tippah County.
Southwest of Satartia, Yazoo County.
One mile south-southwest of Grenada, Grenada County.
Near Louisville, Winston County.
Near Oxford, La Fayette County.
Near Robina, Panola County.
Three miles northeast of Vernal, Greene County.
Near Cross Roads, Greene County.
Near Westville, Simpson County.
In Rankin County.
Artesian Springs, six miles from Pickens, near Camden, Madison County.
Artesian Well (public), Aberdeen, Monroe County.
Two miles southwest of Grenada, Grenada County.
Hazel Dell Springs, 2½ miles from Holly Springs, Marshall County.
Iuka Mineral Springs (chalybeate and sulphuretted), near Iuka, Tishomingo County.
In Holmes County (acid and chalybeate).
Stovall's Spring, three miles.

Saline Chalybeate:

Black Wells, Choctaw County.

Saline Sulphuretted:

La Fayette Springs, La Fayette County.

Sulphuretted Springs:

Brandywine Spring, 20 miles east of Port Gibson, Claiborne County.
Mississippi Springs (once Bunkston Springs), near Raymond, Hines County.

Sulpho-chalybeate Springs:

At Canton, Madison County.

Near Haze Dell, Prentiss County.

Quitman Red Sulphur Springs, or Archusa Springs, ¾ mile south of Quitman, Clarke County.

Uncharacterized Mineral Springs:

Anchosa Spring, Anchosa Creek, near Quitman, Clarke County.

Belmont Springs (or Harrison Springs), 3½ miles northeast of Buckatunna, Wayne County.

Brown's Wells, Copiah County.

Calhoun Springs, near Pittsborough, Calhoun County.

Castilion Springs, near Durant, Holmes County.

Coleman's Well, Jackson County.

Columbia Springs, Columbia, Marion County.

Franklin Springs, head of Well's Creek, Franklin County.

Greenwood Spring, Monroe County.

Holsom-Back Springs, 10 miles southwest of Louisville, Winston County.

Near Poplar Springs, Union County.

At Holmes Mill, near Fearn's Springs, Winston County.

Near Corinth, Alcorn County.

At Pittsborough, Calhoun County.

At Mount Pleasant, Marshall County.

Near Brandon, Rankin County.

Near Steen's Creek, Rankin County.

At West Pascagoula, Jackson County.

Near Handsborough, Harrison County.

Twelve miles northeast of Columbus, Lowndes County.

Mineral Wells, 8 miles below head of Well's Creek, Franklin County.

Multona Springs, 4 miles from McCool, Attala County.

Smith's Springs, south of Quitman, Clarke County.

St. Andrew's Well, one mile south of Monticello, Lawrence County.

St. Ronan's Well, four miles south of Monticello, Lawrence County

Tipton Well, Jackson County.

Vernal Springs, three miles south of Vernal, Greene County.

Winston Springs, near Louisville, Winston County.

White Springs, 3½ miles northwest of Ripley, Tippah County.

White's Springs, 4½ miles south of Fulton, Itawamba County.

White Sulphur Springs, near Garlandville, Jasper County.

ALTITUDE—ITS EFFECTS UPON DIFFERENT INDIVIDUALS, WITH REPORT OF TWO CASES.*

By GEORGE S. GOVE, M. D., Whitefield, N. H.

Some months ago, I was requested by your honorable executive committee, to contribute a paper that should be presented at this meeting. The subject was left optional to me.

For the past four and one-half years I have been enrolled with the invalid corps, and within that time I have met with no case in my limited general practice which would be of special interest to you, but while journeying through California in 1889-'91, there came under my observation two cases of particular interest to me, and I have decided to make a brief report of these cases the subject of my paper, hoping some useful deductions may be drawn from their consideration.

Our route was over the Santa Fe. I had a time-table which also gave the elevation of the most important stations, several being of very high altitude.

Noticing this and also that the rise to all of these is so gradual that one would be scarcely conscious of it, the less so as the railway winds along in apparent valleys with high mountains all about (it being the same when at the highest points), it occurred to me to observe the effect of these high altitudes upon different members of the party.

There were between forty and fifty of us, varying in age from the infant to those who were upwards of eighty, and, all being strangers to me, they furnished an exceptionally good field for study.

At Raton Pass, near the eastern boundary of New Mexico, we reached an elevation of something over 7,600 feet. As we ascended to this, I noticed that some of the children were very restless, calling more frequently for water, while others showed no physical disturbance. What was true of the little ones was true of others regardless of age. There was one person who was making a good deal of effort in breathing. She was using her fan vigorously and her countenance gave evidence of great suffering for the want of air. We were detained at this pass for a short time, but as we descended her discomfort became proportionately less.

* Read before the New Hampshire State Medical Society, September 24, 1896.

Three more high points were to be overcome: Glorietta Pass with an altitude of 8,432 feet; the Continental Divide, 7,295 feet (these in New Mexico); and Flag-Staff in Arizona, 6,933 feet. We made no stop at any of these, but at each of these localities the lady gave the same evidence of distress as at Raton Pass, and while at Glorietta Pass I was called on to prescribe for her. I administered stimulants and heart tonics which served to tide her over the difficulty until the descent could be made, and she required my services no more during the journey.

Meantime, I learned that some time previous to the journey this lady had passed through a severe illness, which was diagnosed by her family physician as pneumonia. This was followed by a troublesome cough and dyspnoea; for the relief of this she was advised by her physician to spend the winter months in California.

After reaching Pasadena, I saw no more of her until about the first of April, when she made her appearance at the Raymond Hotel, where I was boarding. It was upon the eve of her setting out on her homeward journey. In conversation with her I learned that she was disappointed in that she had not gotten the relief from the journey and change of climate that she had been led to expect, and certainly her appearance confirmed her opinion.

I was to return to the East with the same party of which she was a member. We left Los Angeles in the morning and nothing occurred during the day to mar the peace and delight of the journey until along in the night I was called by the conductor to see a lady in another part of the car. On reaching her berth I found the patient to be the same one of whom I have written. She was suffering as she had on previous occasions when making the Passes, only her sufferings were much intensified, so much so that nothing done for her seemed to bring relief; that only came to her as we made the descent from Flag-Staff, when she was again comfortable until we approached the Continental Divide, when the distressing symptoms again returned and her struggle for air was hard to witness; it was only by the greatest exertion that her life was preserved to pass this elevation.

Because she had overcome so much we hoped that she would succeed in withstanding the effects of the higher altitude to be encountered at Glorietta Pass, but when we commenced the ascent to this point she had not fully recovered from the depressing effects of the last attack and soon began to show signs of increased physical disturbance.

The elevation at the summit of this Pass is 8,432 feet, and for a long distance before reaching it the rise is very gradual so that the degree of discomfort attending the high altitude was much prolonged; this she was unable to endure, and just as we reached the summit she struggled in vain for breath and passed away.

This brings me to a case that I was called to treat while in California during the winter of 1891. The patient was a young Canadian, twenty years of age, a domestic in the Raymond Hotel, Pasadena. This young woman, previously healthy excepting for occasional attacks of asthma, had spent an afternoon at the beach, and had passed an hour and a half bathing in the surf and frolicking upon the beach. Late in the evening of the second day after this I was called in to see her professionally. I found her with a high fever, severe headache, labored respiration, and a troublesome cough. I gave her remedies and left orders to be called if these did not bring relief. Early in the morning of the third day I was called to her again. I found the patient laboring for breath, face purple, pulse too rapid to be counted, and plenty of moist rales in both lungs. I was tempted to take blood from the arm, but, being a tramp physician in the State, decided to call counsel.

Dr. D. B. Van Slack, of Pasadena, a worthy gentleman and physian, formerly from near Boston, Mass., was summoned to meet me and responded at once. On his arrival he inspected the patient, who by this time had become delirious and was muttering and coughing constantly. After a hurried consultation, we decided that as the patient was in a critical condition, requiring something to be done at once to relieve the over-burdened heart and lungs, it was best to adopt heroic measures. We opened a vein. At first the blood merely dribbled from it, but by rousing her and using considerable effort in friction, we succeeded in taking a pint of exceedingly dark blood. For a few minutes after the vein was closed we thought the patient would expire, but in about ten minutes there was a change for the better in her circulation, her condition improved so much that in an hour she had become conscious, her respiration was less labored and her face less congested. It was arranged that Dr. Van Slack should meet me again in the evening, but before then I found that the patient was fast relapsing into the condition of the early morning, so I telephoned him to come at once.

When he arrived we re-opened the vein and took from it from a pint to a pint and a half more of blood. Before the vein was

closed there was a perceptible improvement in her condition; the heart-beats were stronger and less frequent, the respiration easier and the face of more natural color. From that hour she continued to improve, going through with double pneumonia with but little suffering, and making a good recovery with no perceptible bad effects from either the disease or the treatment.

The prevailing antipathy to venesection among the people, and also with the greater number of my medical brethren, has often restrained me from resorting to it.

I have been an advocate of it in the early stages of pneumonia, and pleuro-pneumonia, and in reviewing my history of these cases, I find no cause for regret for having resorted to this practice, but I have regretted that I had not employed this means for relief, as my judgment dictated, when my efforts by other methods proved of no avail.

In the history of the two cases given you there was a similarity of conditions, viz., labored respiration, rapid pulse, puffed and congested face, distended veins, and the early maturing of delirium.

The results in the second case were undeniably due to the blood-letting, which relieved the burdened heart and lungs. I was debarred by circumstances from pursuing the same method in the other case, but might not the unhappy termination have been averted could I have done so?

In an address upon "The Special Influence of Altitude upon Health, Disease and Sanitation," Dr. S. E. Solly, of Colorado Springs, who for several years has made a study of this subject, says:

"When air is inhaled into the lungs, a certain proportion of the total amount of oxygen contained in this air is absorbed by the hemoglobin, which is that element of the blood which is contained in the red corpuscles, and whose business it is to absorb oxygen. As each drop of hemoglobin can only take up oxygen in certain proportion to the oxygen pressure of the air, when the oxygen pressure is lowered, as it is in the elevated climates, discomfort ensues to the visitor, because his blood is not sufficiently oxygenated at each ordinary breath. To remedy this he breathes faster, so as to get in more air, and so more oxygen, in a given space of time, and the heart has therefore to pump blood more frequently into the lungs and his pulse beats faster. Such is the temporary remedy, but in time the chest becomes expanded so

that more air is taken in at each breath and the heart is stretched; thus its cavities hold more blood and its walls are thickened, so that the muscle has more force to pump this increased amount of blood

"Nature's method of compensating for this deficiency does not stop here, however, and a still more remarkable change takes place and one in which lies the special therapeutic value of high climate for appropriate cases. This change is the increase in the amount of red corpuscles and hemoglobin; by this the oxygen-absorbing power of the blood is largely fortified in a definite ratio to the elevation."

Experimenters in South and Central America, as well as in the high altitudes of the United States, have done a great deal of work and been able to confute many of the wrong conclusions drawn by the great traveler and scientist, Von Humboldt. These men found that there was a decided increase of certain normal constituents of the blood in a few days, and that many times health and strength followed as a natural sequence. They seemed to establish the following facts, namely:

"That the peculiar effects of high climates are to increase the amount of red corpuscles, hemoglobin, and the power of blood absorption. The chest expansion is also increased, the latter being admitted by all observers, who also have remarked frequently upon the almost emphysematous character of the breathing, especially at the apices of the lungs of the native-born children and old residents.

"With regard to the assumed enlargement of the heart cavities and muscle, no sufficiently precise or extensive experiments have been as yet made to prove what logical deduction and common belief endorse, viz.: physiological cardiac hypertrophy. The remarkable powers of horses raised in high climates to endure prolonged fatigue and great speed, both in their native uplands and also when transferred to the sea level, are matters of common observation and belief. In men, the superior endurance of mountaineers, is also well known. This has been noted especially by Hirsch, in accounting for the endurance of the natives, resident in the high Andes. Further, the results of the treatment of heart disease by the strengthening effect of climbing and high climates, as recommended by Oertel, tend to confirm the belief that the heart is increased both in strength and capacity by altitude. We have then as the special physiological effects of altitude, that is, of diminished

barometric pressure, greater lung capacity, as shown by the increased chest expansion and more forcible breath sounds, a stronger and larger heart and an increased ability of the blood to absorb oxygen.

"For these reasons it may be asserted that there is developed a greater power of resistance to the attempted lodgment of germs within the body, through the increased germicidal character of the more highly oxygenated blood, and through the more perfect workings of the lungs and the heart. We may also assume that there is an equalizing of the circulation throughout the body, and that the tendency to local stagnation of the blood, that is, to chronic congestion, is thereby lessened, while on the other hand, the more vigorous circulation would, if by any accident it should be obstructed at any point, cause a more violent local inflammation and a greater general fever and disturbance."

In this connection I wish to say a word relative to that portion of New Hampshire that we may consider a higher altitude, for while we have nothing except Mount Washington and Moosilauke that is anywhere near as high as the most of Colorado or New Mexico, yet in these two mountains we have pure air, an uncontaminated soil, and pure water; therefore, for three months in a year I do not know why that class of cases may not do as well as to go to the Rocky Mountains.

It is true that patients cannot—without special provisions are prepared—live in these high places in New Hampshire in the winter, but for three or four months. one could make the trial, the results of which might serve to point out the best course for the patient to pursue.—"Atlantic Medical Weekly," Nov. 21, 1896.

THE METHODS OF QUACKS.—One of the most amusing, and at the same time sad, things is to see certificates published in religious papers and others, signed by men certifying that they have been cured of disease by a machine, or a medicine, which is an infallible cure for the maladies spoken of, when to our certain knowledge the signers of the said certificates subsequently died of the same disease. We have noted fifteen cases of as many different remedies, which in corroboration of this statement we should publish, were it not for the grief it would give to the bereaved; and were we to publish them without the names the venders would deny the facts.—"The Christian Advocate."

NEW SEWERAGE OF THE CITY OF MELBOURNE.*

The city of Melbourne is laid out after the plan of the city of London, that is to say, the city of Melbourne proper occupies but a small territory, and it is the suburbs which go to make up the population. The city proper extends from Flinders street to Victoria street from north to south, and from Spencer street to Spring street from east to west, and covers a territory less than a mile in extent in either direction. Surrounding the city are the cities and towns of Fitzroy, Collingwood, Richmond, Hawthorn, South Yarra, Prahran, Windsor, St. Kilda, Albert Park, North, South, East and West Melbourne, Port Melbourne, Brunswick, Carlton, Footscray and others. All these combined make Melbourne, with a population of about 430,000. The population has decreased of late years, many of the inhabitants having gone to seek their fortunes in Western Australia. Some five or six years ago, the population was estimated at nearly 500,000, but the unusual depression and general lack of business have tended to reduce the population to the present figure.

During the fifty-six years of its existence, the city has never built a sewer, and the consequence has been that, as the city grew, the imperative need of a complete and proper system of sewerage became apparent. The matter was mooted from time to time, but it was not until the year 1889 that active steps were taken. Then the Melbourne and metropolitan board of works sent to England and invited the presence here of an expert civil engineer, Mr. James Mansergh to make a detailed report as to the best method of building a sewerage system for the city. Melbourne lies at the head of a landlocked bay some 45 or 50 miles from the sea. It was not practicable to discharge the sewerage into this bay, as there was only a narrow outlet into the ocean, and it was feared that, in the course of a few years, it would accumulate to the detriment of health and navigation. Neither was it considered feasible to build a sewer to the sea, on account of the great distance and the attendant expense.

It was therefore deemed advisable to construct a sewage farm at a distance of 20 miles from the city, and there burn the refuse, and it was to this end that Mr. Mansergh's report was requested. Mr. Mansergh spent some two months here and submitted several reports, from which the present system was finally elaborated, it being a combination of his several reports, with improvements sug-

* Report to State Department.

gested by Mr. William Thwaites, the engineer in charge of the work here. Heretofore, small sewers had been built in some of the streets which emptied into the River Yarra. The liquid refuse was conducted in the first instance into the street channels; it consisted of urine, a small quantity of night soil, kitchen water, bath water, soap suds from the washing of clothes, drainage from stables and sheds, waste liquids and washings of trades and factories, mixed to a varying degree with the surface water from the streets and house roofs.

The River Yarra flows very sluggishly as it approaches the sea, the result being that it is rendered exceedingly foul, unhealthy and unsightly. In examining the outfall of these small sewers, Mr. Mansergh found that the liquid discharged was to all appearances quite as offensive and polluted a compound as the sewage of a fully water-closeted town. The greatest pollution of the air, however, was produced by emanations from the pans for night soil. The closets are frequently close to the dwellings and are not ventilated. The pans are not cleansed in any way and in many instances are not emptied with sufficient frequency. Hence, intolerable odors arise during the process of emptying these receptacles into the night carts. The residue left in every pan after emptying produces offensive effluvia, which remains till the residue has dried and crusted.

Accustomed as we have been to water-closets at home, we find the appliances in vogue in Melbourne disgusting. People who have never known what it is to live surrounded by cess pits, privies, night-soil pans or ill-kept earth closets, will wonder how Melbourne could have existed under such conditions when these things have been swept away and decent water-closets have taken their place. In submitting his report, Mr. Mansergh determined the size of the internal sewers as follows:

(1.) That they should suffice, without any alteration, for a long term of years and so avoid disturbance within the metropolitan district.

(2.) That they should provide the above-named margin of carrying-power for rainfall in addition to sewage proper.

(3.) That by reason of their surplus storage capacity, overflow should rarely occur in rainstorms, as time will be given for the pumping power to overtake the discharge.

Mr. Mansergh proposed the construction of the sewers on the basis of what will be the city's need at the expiration of fifty years, when the population will probably be 1,700,000.

Mr. Mansergh estimated that the scheme he proposed would cost £5,800,000 ($28,225,700); but this scheme was modified by the board of works here and the chief engineer, so that the amount finally appropriated for the work was £3,500,000 ($17,032,750). The work is already more than half completed, and what has been done includes the hardest part of the work, such as tunneling the river for the main sewer. The total amount thus far expended has been £1,800,000 ($8,759,700). It is, therefore, contended that the amount appropriated will be ample to cover the total cost of the work, allowing for all contingencies. Of course, before the whole system is complete many years must elapse; but the board expect to have the sewers in a state to open up, so that connections may be made with all the houses in the city, early in 1897. The board raised the money in England by issuing bonds bearing 4 and 5 per cent. interest. As the money was raised in times of depression, the bonds were not all floated at par.

At the sewage farm, the outfalls end with their inverts at the highest point on the land selected in each case, and as there will always be a certain depth of sewage running in them a greater area will be commanded than would be due to the invert level. Small tanks, with simple screening apparatus, will be constructed at the point of discharge, and from them, open or lightly covered channels or carriers of gradually diminishing size will be contoured with suitable gradients along the high sides of the land, so as to deliver an adequate proportion of the sewage to every part, and from them it will be distributed in as simple a manner as possible over the whole area. Within a radius of three miles from the centre of the city it is imperative for every householder to connect his house with the sewers; beyond three miles, it is for the present optional with the householders.

The sewers are designed to carry thirty cubic feet of sewage per head per diem from the centres of population to the pumping station, which will be situated near the junction of Stoney Creek and the River Yarra.

The amount of rain water allowed to enter the sewers will be reduced to a minimum; only exceptionally polluted surfaces will be provided for, such as cab-stands, stables, cow yards, etc. All the polluted house water from water-closets, urinals, kitchen sinks, baths, washhouses, etc., will be discharged directly into the sewer.

The sewage will be collected at the pumping station by sewers running along the main valley lines of the metropolitan area and

the shores of Hobson's Bay, which will pick up in their course the flow of all the subsidiary drains.

At the pumping station the heavy matter will be separated from the fluid portion by means of strainers, which will be cleansed from time to time, and the material retained by them, mixed with ashes from the boilers, and burnt in a refuse destructor, which will also afford the means of destroying the local refuse of Footscray and Williamstown, the two nearest towns.

The liquid sewage will be lifted from the pumping station about 110 feet from the outfall sewer through three lines of six-foot wrought-iron pipes, about 2½ miles long. The outfall sewer will ultimately be eleven feet in diameter, with a fall of two feet to the mile and capable of discharging 18,000 cubic feet a minute; it will discharge on the sewage farm, which covers an area of about 8,800 acres, situated on the western side of the River Werribee, about twenty miles from Melbourne. It is intended to provide settling reservoirs for separating the sludge from the general body of the sewage and distributing the water over specially prepared areas, the effluent from which will be distributed by broad irrigation over the remainder of the farm.

The board of works have gone about the building of this sewer in a proper manner. Contracts have been made for doing the different work; but the contractors are rigidly held to their contracts. A defective piece of piping is at once rejected, and the utmost care is taken to see that the mason work of the cisterns is all properly done.

As mentioned before, the work is more than half completed. Throughout the entire city the piping has been laid, nine-inch to fifteen-inch pipe carrying the refuse to the main sewer. The plan has been to take a block at a time and lay the pipe at a depth of about twelve feet and make connections with the houses. The character of the soil and the entire absence of frost from the ground have rendered the work comparatively easy, blasting having been necessary only occasionally. The contractors have put on a double set of workmen, a night force coming on at 7 o'clock and working steadily through the night. The contractors are liable, and must exercise every care in the performance of their work; in fact, the same conditions prevail that are usual in all cities on work of this kind. The workmen engaged in laying the pipes through the streets are paid from $1 to $1.50 per day for eight hours' work, and the wages of the men at work in the tunnels and the main sewer run from $1.25 to $3 per day.

The board has issued specifications for the supply and delivery of steam-plowing gear in full working order at the sewage farm. The boilers of these engines must be tested by 240 pounds on the square inch by hydraulic pressure, and the requirements usual in like cases prevail. Cultivators, steam harrows, Crosskill rollers, Oliver plow and ditching plow are also called for in the specifications. There follow specifications for water-closet pans, engines and boilers for the pumping stations; in fact, the board undertake the supply of every requisite necessary to the completion of the work and the connection of the houses with the main sewer. The board also protect the workmen, and in any case in which the contractor fails to pay them their wages, the board is empowered to do it and deduct it from the money of the contractor.

A few words in description of the sewage farm. The total area of the farm is 8,847 acres, subdivided in the following manner:

	Acres.
Available for irrigation	7,523
Tree plantations	357
Private roads in the farm	230
Township north boundary of farm	29
Township near mouth of Werribee River	73
Board's sheds and offices	16
Not suitable for irrigation, but available for grazing purposes	619
Total	8,847

The methods adopted for dealing with sewage in connection with land are arranged under three heads:

(1.) Chemical precipitation and subsequent treatment by irrigation on the land.

(2.) Purification by broad irrigation.

(3.) Purification by intermittent downward filtration.

The first and third systems are only admissible where the value of the land is prohibitive. The best purification, the least expensive in maintenance, and the one giving the most profitable results is by the second system. The ratio adopted is one acre for every 100 persons. The sewage farm as purchased for these different ratios would be suitable for the following populations: Ratio of 1 acre for 80 persons, 707,760 people; 1 acre for 100 persons, 884,700 people; 1 acre for 110 persons, 973,170 people. It is, therefore, evident that the farm is only suitable for broad irrigation for less than 1,000,000 people, for which population the rest of the scheme is being designed. The estimated cost of the farm at Werribee is $285 per acre, including improvements. The actual work of

preparation is steadily proceeding. The preparing and draining of the ground is being confined to the central block on the farm, which will provide for the requirements of several of the suburban towns. The drainage from other suburban towns will be begun as soon as the river tunnel is completed, probably about October next, and thus one by one the different cities and towns will be dealt with till the system is complete. The farm is rented to tenants, who raise market produce and vegetables, and it is desirable that as many tenants as possible should be established on the farm. The work to be carried out by the board at the farm during the next two years will consist of—

(1.) The completion of the main carriers and subcarriers through the central portion of the farm.

(2.) The continuous preparation of the 20-acre blocks, which will be sown with permanent grasses, chiefly lucern and prairie grass.

(3.) Erection of a jetty in Port Philip Bay and the provision of the necessary tramway plant for the farm.

As soon as sewage can be discharged on the 2,000 acres, lucern and prairie grass can be grown on them, and if the board can obtain $30 per acre per annum for them it will be in a splendid financial condition.

The total area to which sewerage is to be applied under the act covers 85,502 acres; but the net area available for population is only 77,933 acres, and this latter area can be sewered when the population demands it. The area which could be covered by sewers, viz., 32,484 acres, does not amount to more than 43 per cent. of the area available for population, while the area which should be covered at as early a date as possible amounts to only 21,163 acres.

The valuations of property in Melbourne have altered so during the past few years that it is extremely difficult to establish a rate. The valuations for the year 1895-96 are below those for 1886-87. Unfortunately, during the period of inflated values, the water rate was decreased from 8d. (16 cents) in the pound to 6d. (12 cents), and by the board's act. No matter how the values may fall, this rate cannot be altered. As the water rate cannot be varied, the whole variation must take place in the sewerage rate. The reduction during the past twelve months in the value of real estate has been £857,000 ($4,170,590), but it seems scarcely conceivable that any further great reduction will take place, though it is possible in the great reaction from excessive valuations. During the year

1896-97, if the water revenue does not sink below £147,000 ($715,373) and another loan of £500,000 ($2,433,250) be floated, the sum to be provided for by rates will be £95,000 ($462,317), by which time the sewerage expenditure will have reached £2,300,000 ($11,192,950), or nearly sufficient to provide for the twelve central municipalities. No rate had been necessary up to June, 1895, when £1,300,000 ($6,326,450) had been expended on sewerage, the surplus revenue from water having met the interest, management and maintenance charges. At the present time, however, the sewerage expenditure has been increased to £1,800,000 ($8,759,700), and as there has been no reticulation in operation there will be a deficiency of about £29,000 ($141,128), which can be met by a rate of 1¾d. on the whole area. To meet the requirements of the years 1896-97, a rate of 3d. (6 cents) over the whole area and 6d. (12 cents) on the reticulated areas will be required.

The main sewer is constructed in a like manner to those of the large cities at home, and a man can walk through it standing upright. It is thoroughly well built and the mason work is of the very best. It is built from the city under the river (for this it was necessary to go very deep), and extends out to the sewage farm. At the building of the sewer under the river, some months ago, a serious accident took place, causing a heavy loss of life; the water from the river burst through into the tunnel and drowned the workmen before they could be rescued.

The board have reason to congratulate themselves on the great saving which they have accomplished in performing the work. At the lowest estimate they have saved £1,500,000 ($7,299,750) on Mr. Mansergh's figures, and yet the work has been performed to the entire satisfaction of all concerned.

The estimated average cost of house connections will be $75 each; but the ratepayers are now paying £70,360 ($342,406) per annum for the existing night-soil service, and it is considered that their payments will not be materially increased. If the board adopts the proposed system of contracting with householders to carry out the internal fittings and receive deferred payments, the cost to the ratepayers will be both reduced in amount and lightened in incidence.

Up to the present time, the board has laid 140 miles out of a total of about 800 miles.

The unexpended balance of £1,800,000 ($8,759,700) the engineer in chief considers will be ample to deal with all the requirements of

the existing population as originally estimated, and will also provide for reticulating rights of way and constructing the house branches up to the building line, which expenditure was not included in the original estimate.

In summing up, let me give some exact figures. The following estimate was submitted by the board on October 10, 1894:

Description.	Amount.	
Farm purchase	£153,000	$744,574
Outfall sewer and rising	360,000	1,751,940
Pumping station and buildings	80,000	389,320
Engines	120,000	583,980
Main sewers	914,452	4,450,180
Branch sewers	590,000	2,871,235
Reticulation pipe sewers	1,073,600	5,224,674
Farm preparation	160,000	778,640
Total	£3,451,052	$16,794,544

As mentioned before, the amount appropriated was £3,500,000 ($17,032,750), and the amount expended up to date (with the work more than half completed) is £1,700,000 ($8,273,050). Making allowances to provide for the future forecast population, it is estimated that the total cost will be about £6,000,000 ($29,199,000). It has been determined to construct the main sewers on the basis of a population of 1,000,000, at the rate of 30 cubic feet per head per day on the separate system, and that the mains and submains be supplemented in the future, from time to time, as the necessity arises; but at the same time, it is proposed that the sewers in Melbourne be constructed of the same size and capacity as in Mr. Mansergh's scheme, as it is considered that the population ratio is already small enough, being only forty per acre.

The work on the sewers was begun on May 19, 1892, when the Earl of Hopetoun, the then Governor of the colony, turned the first sod. His lordship identified himself thus with the work and was at all times interested in it and in its ultimate completion.

To sum up and recapitulate the work done thus far, the sewage farm has been plowed, harrowed and prepared for reception of sewage to the extent of 2,000 acres, and almost all the residue of the land has been divided by fences and let to tenants for cultivation or grazing at rentals which give a fair return of percentage on invested capital; many cottages are already erected, and water from the metropolitan supply is furnished to each cottage at the rate of £1 ($4.86) per year; the main outfall sewer—16 miles in length, from the sewer farm to the head of the rising main, of concrete and brick,

semicircular where open and circular of 11 feet diameter where closed, and with three aqueducts over the river and two intersecting creeks—has been extended into the farm, with distributing head connected with two main sewage carriers; the rising main, 227 chains long, in two tubes of wrought-iron pipes, through which the sewage will be raised 120 feet into the outfall sewer, is completed and connected with the pumping wells; the pumping engines are delivered at the pumping station and the engine house is built for their reception; store sheds are erected and the store yard is leveled and ready for use. In constructing the main sewers across the delta between the River Yarra at Spottiswood and the lagoon at Port Melbourne through strata of alluvial or marine silt, serious difficulty has been experienced by the contractors. The reticulation of streets with sewerage pipes and the connecting of the houses with the sewers throughout the city is nearly completed; there only remain some of the small streets, lanes and right of way to be done. It is anticipated that the sewers in and immediately surrounding the city will be ready for use in the present year. The several amounts, as needed, have been raised in London and the bonds have been floated at rates varying from 98 to 101 per cent. These bonds generally carry 4½ per cent. interest, and their present price on the London and Melbourne markets is 104 to 108 per cent., according to the time they have to run. To quote and apply the words of Lord Rosebery in addressing the members of the London County Council at the close of their first year's proceedings: "What has sustained you in this work has been neither fee, nor fame, nor praise; it has been the pure impulse of a clear duty and a generous ideal." So of the work here, it may be added—a distinct appreciation of the work in which they are engaged, the blessings of increased comfort, salubrity and life, while the work confers the merit of removing what is the only physical blot upon the fair fame of this beautiful and healthy metropolis, and a consciousness of the higher and broader capacity for usefulness which will remain to the board here when the huge task shall have been completed.

In closing my report, I desire to acknowledge the obligations I am under to the Melbourne and metropolitan board of works for voting to furnish me information, etc., and to the engineer in chief, Mr. William Thwaites, to whose courtesy I am indebted for much valuable information.

DANIEL W. MARATTA,
Consul-General.

Melbourne, July 16, 1896.

MEDICAL EXCERPT.

By T. P. Corbally, A. M., M. D.

Chronic Rhinitis.—Dr. L. Pelaez recently presented an elaborate communication to the Oto-Rhinological Congress, on chronic rhinitis and the erectile tissue of the nasal mucous membrane, from which "El Siglo Medico," 17th January, gives the following conclusions:

1. There are cases of rhinitis that are caused exclusively by disturbance of the genital organs.

2. Such cases may have their origin in a disease of the sexual organs acquired before or after birth: in the former case, it depends always on some histo-organic anomaly; while in the second case it may be traced to a great variety of causes.

3. The most frequent anomalies of the genital organs, such as give rise to chronic rhinitis, favored by occasional well determined causes, are what may be called *macro-erectilia* and *micro-erectilia* of the organs of copulation, which coincide respectively, according to the author's observations, with the macro-erectile and the micro-erectile, mucous tissues of the nose.

4. There are, probably, reflex centers of the naso-erectile tissues of the bulbar or bulbo-protuberant, the erectile conductive, the bulbo-medullary and the medulo-bulbar.

5. The existence of the naso-erectile tissue is in accordance with genesic use which relates to the sense of smell in some animals.

6. Cases of scrofulous rhinitis are very frequent; this frequency depends on the histological constitution of the nasal mucous in lymphatic subjects and in those of a scrofulous constitution.

7. Pre-vertebral, intraparotid and peri-hyoideal cases always depend on scrofulous rhinitis.

8. Independently of the special observations of the oto-rhino-laryngologist, it ought to be the special care of every general practitioner of medicine to employ rhinoscopy in all chronic diseases of the digestive tube, of the respiratory organs and also in all the neuropathic affections, especially if facial evidences of probable degeneration are present.

9. In hypertropic rhinitis of genital organs, the first indication is to institute adequate treatment and regimen for the disease of the sexual organs and the regulation of their functions.

10. If, notwithstanding this treatment, and appropriate regimen, the chronic rhinitis persists, and is hypertropic in character, do not hesitate to practice in the region supplied with naso-erectile tissue, active galvano-cautery and all the different operations on the nose that may be considered necessary.

11. Extensive operations on the organs of generation may be necessary as a means of removing atropic rhinitis that accompanies intractable, progressive disease with macro-erectile conditions of the organs of generation.

12. Such operations may be performed on monkeys.

13. The aim of the rhinologist, however, ought to be to substitute, for castration, the removal of the thyroid gland if indicated, or some other less serious operation.

14. In order to obtain this result it is absolutely necessary to study the anatomo-physiological, and evolutional relations that exist between the thyroid body and the genital organs, or to make a more profound and pathogenic study of rhinitis.

15. The genito-thyroidal and naso-genital relations may be studied in many of the mammiferous animals.

16. Scrofulous rhinitis, accompanied or not with adenapathic conditions, require almost exclusively a proper general therapeutic treatment, and mild local antiseptic remedies.

17. The anatomist has a vast field for study in the polyclinic, and the clinical student must refer constantly to organology, to hystology, to embryology, to tetratology, and experiment to insure his diagnosis, or be exact in his prognosis, and to improve hygienic and therapeutic methods.

Much of the matter, here too briefly described, has been observed, but the extensive relations of the different organs was not so fully analyzed. Deafness, myopia, and skin diseases are often dependent on rhinitis.

THE CHOLERA MICROBE.—The "Anales del Departamento Nacional de Hygiene," Dirigidos porla Oficina Sanitaria Argentina, December, 1896, publishes the following curious observations from a letter of Hankin to the Institute Pasteur, Paris: "I hope to send you soon a summary of my discoveries regarding the property that the water of some rivers of India, as the Jumma and the Ganges, have of destroying the microbe of cholera. This action as a bactericide, seems to me to be produced by certain volatile acids. This discovery is of special interest because it explains why, in India, cholera is never propagated in the valley of the Ganges in the direc-

tion of the current of the river, but always comes to us from Bengal. Frequently the bodies of people who have died of cholera are thrown into the rivers, and, as hitherto, no case of contagion has been known to be spread in this way, not even among the people who drink the water of the rivers; the physicians of India are not willing to admit that cholera has its origin in the water.

"I have discovered, however, that the microbe of cholera multiplies with great activity in the water of the wells in that district. There are only a few rivers that seem to have the wonderful power of purifying themselves. I will cite, as an example, the observations made regarding the water of the river Jumma, which flows by and quite near to Agra. This is a city of 160,000 inhabitants, and all the sewers of the city are emptied into the Jumma. The contamination with bacteria which is thus produced disappears in less than twelve and a half miles below the city; the number of bacteria in the cubic centimeter, which is from 700 to 830 above the city, increases to 16,000 and to 21,000 as it passes before the inhabited parts and is again reduced to 6,200, 5,600, 4,200 in the three or four miles below; 500 or 600 at a distance of five or six miles, and 120 miles further down there is only 125 to 130; a number equal to that found at Dhobus Ghat, five or six miles above Agra. In regard to the cholera bacillus, the water has the same influence as a bactericide, whether taken above or below the city; in the immediate surroundings of a cadaver that has been thrown into the stream, or around a cadaver that has remained a long time in the water, there is no contagion. The water of the Jumma, boiled, like the water of the wells, favors the multiplication of the microbes. Other experiments of a similar kind have given the same results, and cultures in peptones have demonstrated that all the cholera microbes perish really in the water of the Jumma."

RADIOGRAPHY AND RHEUMATISM.—M. Fournier presented to the Academie de Medecine various specimens showing the results of radiography; Gazette Hebdomadaire, 24th January: 1. A fracture of the femur; 2. Fracture of the neck of the femur; 3. The articulations of the hand in chronic gout; 4. Syphilitic Periostitis.

The discovery of Rontgen is now found extremely useful in a series of interesting applications.

As a means of diagnosis, it is most useful in affording the possibility of discovering the nature of deep-seated lesions of the bones, of tumors, diseases of the viscera. It also assists in determining their various conditions in the deep cavities of the human body.

We have already shown the resources afforded by radiography in the diagnosis of tuberculosis, pleurisy, of cysts, cancerous tumors, etc. Now we can announce that there is a possibility of making a differential diagnosis between gout and rheumatism.

M. Potain and one of his pupils, M. Serbanesco, have photographed, by means of the X rays, the hands and the feet of gouty subjects, and they have found, at the extremities of the bones that have been deformed, the existence of clear, distinct spots, indicating that the bone at this point has been more permeable to the invisible rays; while at the periphery of the stains there existed a thin, dark border, accompanied with a greater degree of opacity.

On the other hand, in the bones of healthy persons, or of those affected with chronic articular rheumatism, nothing similar is found. It seems, then, that the examination, by means of the radiographic rays, can, in such cases, aid in the differential diagnosis, sometimes so difficult in cases of gout and rheumatism. And, in fact, in cases of lead poisoning, in which deformative polyarthritis is found, supposed at first to be rheumatism, MM. Potain and Serbanesco have observed clear spots, a fact that has enabled them to change the original diagnosis.

This increased permeability of the bones of the epiphyses, seems to be attributable to the presence of deposits of urates of soda. The authors have also found, by direct experiment, that this salt is eight times more permeable to the rays than the salts entering into the normal composition of the bones; phosphate of calcium, chloride of sodium, etc.

Diphtheritic Paralysis and Nerve Changes.—"Le Progres Medical:" Experimental researches have been made to determine the nature of the changes that take place in the nervous system. The pathological anatomy of diphtheritic paralysis is still a subject of very diversified opinion. These opinions may be classified in three groups; some authors have found lesions localized in the cells of the anterior coruna of the spinal marrow; others have found it in disturbance of the peripheral nerves; and, finally, some have found both lesions existing in the same patient; a last group is formed by cases in which the most careful examination cannot discover any alteration, either in the trunk of the nerves or in the cells of the anterior coruna.

To elucidate this subject, a series of experiments have been made. Rabbits have been inoculated, some with cultures of the

bacillus of Loeffler, others with the diphtheritic poison. In all these the effort was directed specially to prolong the life of the animals as far as possible.

From all the experiments the following conclusions have been drawn: the diphtheritic poison seems to attack the spinal marrow, the nerves of the medulla, and the inferior parts of the bulb, exclusively. The protuberance and the brain remain intact. In the spinal marrow the poison attacks preferably the nerve cells; lesions of the white substance are exceptional; the affection is specially a subacute myelitis of slow progress. In regard to the nerves, a degeneration very similar to the degeneration of Waller has been observed: this lesion is found especially marked at the anterior roots; the posterior roots are relatively free. The myelitis is the primitive lesion, the nevritis is secondary. In many the diphtheritic poison causes two kinds of paralysis; the first, localized in the mouth, the nose, the eyes, the larynx, the pharynx, arise from a peripheral nevritis; the second, general throughout the whole body, beginning in the lower extremities, arises from a primitive myelitis progressing to a secondary nevritis.

These cases are very variable in character and duration. A few years ago a patient about twenty-three years of age, remained in Saint Peter's hospital about three months before he showed any signs of improvement. During that time all food was conveyed to the stomach through a tube; at the end of four months he was sufficiently improved to leave the hospital; the case was observed for some time longer, when recovery was nearly complete. In his case the paralysis was of the former kind: limited to throat, larynx, and pharynx; eyes not affected.

A Case of Chronic Pleurisy with Effusion Effectively Treated with Protonuclein.—Dr. Almon H. Cooke, of Buffalo, N. Y., reports ("New York Medical Journal," Oct. 10, 1896): "On June 2d a lady came into my office in a greatly disturbed state of mind, telling me that she had suffered from an attack of pleurisy since March 1st, and now she had been told that 'it had turned into an abscess on the lung, and that she must go to the hospital (to her a place of torment) and have a tube put through her ribs,' to say nothing of being 'laid up' for six or eight weeks.

"On examination there were evidences of adhesions at the base of the right lung, also indications of a small amount of fluid which I suspected would be pus. However, the exploring needle proved it

to be of a serous nature, slightly cloudy, due to the presence of a few pus cells. The following treatment was outlined, and, I am happy to say, was faithfully executed:

"Protonuclein tablets, three grains (Reed and Carnrick), half an hour before meals and at bedtime, subsequently increased to five tablets *per diem.* Also ten minims of fluid extract of cascara at bedtime, to regulate the bowels, which were in a torpid condition. Besides this, the surface over the painful area was painted with iodine every second or third evening, as the condition of the skin permitted.

"Her diet consisted of not less than half a pound of lean beef or chops at two meals each day, with vegetables in limited quantities, to which was added half a pint of cream each day, to be consumed in a manner most agreeable to the patient.

"The result of this treatment was, that the patient gained flesh at the rate of a pound a week and strength in accordance. The temperature became normal at the end of the second week, and deep inspiration gave no pain early in the third week. No trace of fluid could be found by the tenth day, while after eight weeks of treatment the patient declared that she never felt better in her life.

"This case seems to me to be one which demonstrates the beneficial properties of Protonuclein, especially when combined with a nourishing diet. There can be no doubt that this case would have terminated in empyema, and that very shortly, had active treatment been delayed; and I believe that many cases of pleurisy with an effusion which is not absorbed so rapidly as it ought to be, would be speedily cured by a treatment substantially the same as the one employed in this case."

Iodia as an Alterative and Sedative.—Dr. H. G. Reemsnyder, of Ephrata, Pa., reports ("Medical and Surgical Reporter," Jan. 16, 1897) the beneficial effects of Iodia in several cases of secondary syphilis. He commends its use in all such chronic complaints as suggest the need of sedative alteratives calculated to promote functional activity in the elimination of adventitious deposits without depletion.

Management of Pneumonia Patients.—An interesting discussion ("Medical Record," Dec. 12) recently took place on this subject before the New York Academy of Medicine. Dr. S. Baruch, although strongly advocating hydrotherapy, said that Phenacetine was occasionally useful. Dr. E. G. Janeway stated that he

was not one of those who decried the coal-tar series of drugs. He had given patients a great deal of comfort at times by their use. In one case, in which the temperature rose to 106° F., cold compresses did not reduce it and the attendant restlessness, while Phenacetine did. This experience was repeated twice in that case. The Phenacetine reduced the temperature and also induced sleep, as morphine might; but it did not, like morphine, cause constipation, tympanites, and derangement of the liver. Discouragement of the coal-tar series, on account of depressing effects, came from Germany, where they gave very large doses of everything. It was Dr. Janeway's custom to give the smallest dose which would accomplish the purpose, and not to give the largest dose which the patient could stand.

DISINFECTION OF THE MOUTH IN SCARLATINA.—M. Lemoine recently advanced the theory ("American Medico-Surgical Bulletin") that the period of contagion in scarlatina is at the beginning rather than at the close of the disease. According to this view, the secretions of the mouth and pharynx are the dangerous elements rather than the desquamating epithelium; the disinfection of these cavities should, therefore, take first rank among prophylactic measures, and the period of isolation to which cases of scarlatina are at present subjected should be considerably shortened.

This theory is important, in that other eruptive diseases, as measles and smallpox, may perhaps be transmitted by the same means.

Until the pathology of these diseases is better known, it seems rational treatment to disinfect the mouth and pharynx, thus possibly rendering a service both to the patient and to the attendants.

For this purpose, Dr. J. D. Albright ("Journal American Medical Association") suggests the use of Glyco Thymoline (Kress) as an effective prophylactic as well as pleasant to the patient. LISTERINE also fulfils these conditions in a pre-eminent degree and may be relied upon in all such cases.

VALENTINE'S MEAT JUICE is very favorably reported upon by R. Mortimer Yule, M. D., Medical Officer of Health. Bressay, and several other reliable observers, as an effective remedy for influenza and its sequelae. Dr. Thomas C. Taylor, of New York, testifies to its value as exemplified in his own family, various members of which, being prostrated with influenza, were unable to keep anything else upon the stomach. Our own experience is alike favorable to its use.

EDITOR'S TABLE.

SANITARIAN, MARCH NUMBER, 1897.

☞ ALL correspondence and exchanges and all publications for review should be addressed to the Editor, DR. A. N. BELL, Brooklyn, N. Y.

BROOKLYN'S WATER SUPPLY AND ITS IMPURITIES.

It is very remarkable that, in considering the shortage of Brooklyn's water supply and the recent suggestion by the chief engineer that water meters should be used and the people put upon an allowance, no one seems to have thought of possible waste by other means than excessive household use. May there not be other leaks? This question is certainly pertinent, in view of one of the most recently constructed reservoirs of 400,000,000 gallons capacity, which will not hold water at all. And, it has been reported with regard to some of the older ones, that on raking out the debris which has been accumulating ever since the time of their construction, the water rapidly sinks to a lower level. That there is immense leakage somewhere—greatly in excess of the per capita consumption and waste estimated by the engineers—is self evident. The water is still tainted, perhaps the more by reason of its agitation during the process of cleaning the ponds and streams. Although there are no results thus far to demonstrate its unwholesomeness, there is no question of its increased liability to become so by reason of the still retained impurities. And it is greatly to be hoped that the thorough cleansing of all the reservoirs and their tributaries may be accomplished soon. With regard to sources and quantity, it would be interesting to others besides Col. Waring, who though they may be like him—"were never in charge of the distribution of a water supply * * * nor had the problem of hunting for water sources at any time a part of his professional duties"—to know what becomes of the water so abundantly supplied to the great water basin of Long Island. We took occasion two years ago (Vol. 34, p. 325) to describe the well-nigh impervious bottom of this basin with its inexhaustible supply of water from the clouds and its inimitable filter bed. Our estimate of the rainfall was 3½ cubic feet—it is a little more—upon each square foot of surface, which is upward of 83,000,000 of cubic feet, or 622,500,000 gallons to the square mile. The whole surface area of this sand-

filter bed and basin is about 2,000 square miles. It is quite safe to estimate that one-fourth of it could be made available to the Brooklyn water supply. In conversation with a distinguished engineer on this subject some time ago, he said, "but you ought to know, doctor, that only about 15 of the 43 inches rainfall can be made available." Admitting this, and after making allowance for every possible loss through natural sources, there would still remain enough available by properly exercised engineering skill to supply half a dozen Brooklyns. To argue otherwise is seemingly to admit that the availability of two or three hundred driven wells—most of them to the depth of the first water struck, 20 to 40 feet from the surface and only one to a constant flow—a dozen or so of ebb and flow ponds (through the sand) and a half dozen other and better constructed reservoirs, but all of them more or less leaky, is a fair test of engineering skill, and a justification of the enormous outlay contemplated for going to the Adirondack lakes. It is sincerely to be hoped that the commission for the investigation of water supplies, proposed by Senator Brush, will be appointed, and that it will not overlook the folly of this contemplated enterprize, nor the contemplated crime of restricting supplies for domestic purposes by the use of water meters. An abundant and unrestricted water supply is so intimately associated with the health of people that the bare suggestion of water meters and restricted allowance for domestic purposes makes one shudder as he recalls the history of a few ages ago when a tax was imposed on water and light, contemporaneously with an annual death rate of 50 to 100 per 1,000 living among the people who maintained it. Water is indeed no less essential to the health of people than light, and it was so regarded even in ancient times among the most enlightened people, who incurred enormous outlays and conveyed it from great distances in order to supply the wants of the people without restriction, and they were the only healthy people of the period. Indeed, wherever the water supply of a people has been scant or intrusted to the persons who are more careful of party interest than of the public welfare, or where this best and most abundant gift of Providence has been treated as a luxury—made abundantly accessible to the rich, while being stinted and doled out to the poor—*there* there always has been and by continuance always will be an unhealthy community. The responsibility for such conditions, though instigated they may be by individual officials, rests upon the civil authorities as a body.

Already the public authorities of Brooklyn have incurred the responsibility of ignoring the behest of the legislature to provide and the *rights* of the people to have public baths. And now, as if the denial of baths to those who most need and cannot otherwise obtain them, were not enough, the suggestion is made that the supply of water for other purposes be curtailed! The best expression of good government is the securement of the greatest amount of happiness to all. Nothing is more essential to the health and moral condition of the people than an unlimited and unstinted supply of pure fresh water.

SWIMMING POOL FOR WOMEN.—The swimming pool connected with the new gymnasium at Pratt Institute is the first to be opened to women in Brooklyn.

This swimming tank is 44 feet in length, 15 feet wide, and is lined with white porcelain tiles. It is supplied with water from an artesian well, which fills the tank with fresh water daily. On the left of the main hall are the dressing-rooms, needle baths, measuring and massage rooms. Each girl has her own locker, where she keeps her "Jim" suits, etc.

The course of gymnastic exercises has been arranged with the aim to secure a symmetrical development of the body, to increase the strength of the muscles, the circulation and the respiratory powers, and to gain agility and grace. The exercises are designed to remove much of the embarrassment, nervousness and faltering characteristics of those who have not a well-developed control of the body.

The work consists of Swedish educational gymnastics, including free standing exercises, running, jumping, vaulting, and the use of the horizontal ladder and of inclined and vertical ropes. Exercises with clubs, wands, dumbbells and foils are also given. A certificate is required from each student, signed by her physician, stating her physical condition at the time of entrance. Gymnasium costumes and shoes without heels are required for all classes. Corsets and close-fitting waists will not be allowed in any of the exercises.

FIGHTING CONSUMPTION is not fighting consumptives by any means. On the contrary it is caring for them in such a way as to promote their chances of recovery and to protect others from the disease. Intelligent people generally now know that the disease is caused by a germ, the tubercle bacillus, which the sputum of con-

sumptives contains myriads of, but from which they cannot escape so long as it remains moist. The danger is the floating of the germs in the dust of the dried sputum, and its consequent liability to be inhaled; and above all by persons whose resisting powers are below par from any cause, though no person, however well, can be considered absolutely exempt from the danger. Surely it is the duty of every person, sick or well, and no one can be more keenly alive to this duty than consumptives themselves—who would be the last to afflict in like manner those who are dear to them or other persons. But to health authorities it is not only a duty but an obligation, which no conscious one can shirk, to do all he can to subdue this most universal and most devastating enemy of mankind—the tubercle bacillus.

"Spitting Cars."—Among the suggestions made at St. Louis, on account of the difficulty in the enforcement of the order of the health department against spitting on the floors of cars, one is that a few cars be run over the lines with the placard "Spitters' Cars" on their sides. The innovation would certainly arrest the attention of the human hog and perhaps work his cure. But such a device would not be necessary in New York if President Wilson's inspectors were to make an example of an offender now and then.

Polluting our Streams.—When the wolf in the fable accused the lamb of polluting a stream from which the wolf drank, the lamb replied that he was not born then. "Well, then," said the wolf, "it was your father," and straightway carried out his original purpose of eating the young lamb. Whether it was the people of to-day or their fathers who first began the work of stream pollution is immaterial to the question of cleansing our streams and rivers, and it is an evidence of the public sentiment that has been aroused over the matter that the courts of Connecticut have recently decided that towns in that State which have been in the habit of discharging their sewage into rivers, must dispose of it in some less objectionable way. The result has been that one of the cities in question has applied to the Legislature for permission to construct a sewer, thirty miles long, to Long Island Sound, and that others are debating the question as to what means to employ to remedy the evil. When large communities depend on rivers for their drinking water, and these rivers are in turn fed by streams into which sewage has been emptied, the solution of the problem becomes an important one. The new Governor of Connecticut,

in his first message, suggests the creation of an expert commission which shall make suggestions to towns and cities that may be undecided as to the proper means to employ to bring about a change.

ELLIS ISLAND DISINFECTION PLANT.—The necessity for extra precaution against the bubonic plague has led Dr. Senner, under the direction of Surgeon-General Wyman, to transfer to Ellis Island the extensive folly plant which was installed on Sandy Hook, at the time of the cholera scare in 1892, when the attempt was made by the U. S. Marine Hospital service to capture the New York Quarantine. The purpose is to require all immigrants detained over night to have a bath, and all clothing and baggage suspected of possible infection subjected to steam of a temperature of 215°, before admission to pratique.

A DEPARTMENT OF PUBLIC HEALTH.—Another bill has been introduced in Congress, prepared and indorsed by the Pan-American Medical Congress, recently held in Mexico, by Mr. Gallinger of New Hampshire. The range of subjects which it embraces, and upon which reports are directed to be made, covers every phase of vital and social statistics, the conditions of the laboring classes and their workshops, the origin and classification of insanity, the soundness of food and the purity of water supply, drainage, sewerage, etc.

It is to be hoped that the delegates to the Pan-American Medical Congress, from the West Indies and most of the States of South and Central America, who have shown such concern for the people of the United States, on returning to their homes, will not continue to be, as heretofore, unmindful of conditions which are a constant menace to the public health of this country through commerce.

MORTALITY AND MORBILITY REPORTS AND REVIEWS.

Correspondents under this head are particularly requested to be as prompt as possible.

ALABAMA.—W. H. Sanders, M. D., State Health Officer, Montgomery.

Mobile, 37,817: J. A. Abrams, M. D., Health Officer, reports for November: Deaths, 73—24 under five years of age. From consumption, 13; annual death rate, 23.16.

For December: Deaths, 68—21 under five years of age. From consumption, 20; annual death rate, 21.48.

CALIFORNIA.—J. H. Davidson, M. D., President, Los Angeles; J. R. Lane, M. D., Secretary, Sacramento. The Secretary reports for December: Returns from 51 cities, towns, villages and sanitary districts, aggregating a population of 744,280, show a mortality of 1,075—a death rate of 1.44 per 1,000, or an annual death rate of 17.28. 181 were from consumption, 91 from pneumonia, 26 from bronchitis, 7 from congestion of the lungs, 29 from diphtheria (and croup), 23 from typhoid fever, 6 from malarial fevers, 5 from cerebro-spinal fevers, 47 from cancer, 3 from erysipelas, 117 from diseases of the heart, 2 from alcoholism.

Reports of prevailing diseases from 25 localities outside of the larger cities and towns give 99 cases of pneumonia, 124 of bronchitis, 17 of pleurisy, 22 of congestion of the lungs, 37 of croup, 152 of measles, 36 of whooping cough, 197 of la grippe, 11 of typhoid fever, 99 of malarial fevers, 4 of cerebro-spinal fevers, 10 of erysipelas.

San Francisco, 330,000. Reports for December: Deaths, 603—111 under five years of age. From consumption, 90; acute pulmonary diseases, 80; from zymotic diseases, 38; diphtheria (and croup), 13; typhoid fever, 9; annual death rate, 20.7. Contagious diseases reported during the month: Diphtheria, 60; scarlatina, 33.

Los Angeles, 100,000. Reports for December: Deaths, 111. From consumption, 22; acute pulmonary diseases, 6; diphtheria, 8; typhoid fever, 4. Annual death rate, 13.3.

COLORADO.—Denver, 150,000. William P. Munn, M. D., Health Commissioner, reports for January: Deaths, 166, of which there were from typhoid fever 7 cases reported, 2 deaths; diphtheria, 24 cases, with 8 deaths; scarlet fever, 13 cases, 1 death; from consumption, 47; pneumonia, 19; annual death rate, 12.44.

CONNECTICUT.—Professor William H. Brewer, Ph. D., New Haven, President; Professor C. S. Lindsley, M. D., Secretary, New Haven.—The Secretary's bulletin for January comprises reports from 166 towns in the State, with an aggregate population of 851,060, from which the number of deaths reported for the month was 1,123. The death rate for the larger towns is 15.6; for the smaller, 16.4, and for the whole State, 15.8. Deaths from zymotic diseases, 103—9.1 per cent. of the total mortality—chiefly from diphtheria (45), typhoid fever (7), and scarlet fever (4); from consumption, 99; pneumonia, 163.

In the published report of a new city charter for New Haven,

the following extract is singularly pertinent to the public appreciation of the value of the health service: "There shall be a department of public health under the care and control of a board of health, consisting of five members, two of whom shall be physicians. All members shall serve without compassion." It may be that this last word expresses the typesetter's sense only, but it is to be hoped that the members of the board, in the exercise of their duty, will always entertain it for its pertinence to the estimate of their service by charter makers.

DISTRICT OF COLUMBIA.—Three measures affecting the sanitary welfare of the District passed the House. All were prepared by the Health Office and urged by the Commissioners. They are a bill for the regulation of cemeteries and the disposal of dead bodies in the District, which Health Officer Woodward and the medical fraternity of the District regard of great importance, a bill regulating privies, and a bill to prevent the spread of contagious diseases. With regard to the last named, physicians attending the cases must isolate them and designate their location, and furnish other information for the Health Officer. Recovery or death from these diseases must be reported in twenty-four hours. The Health Officer is to place placards on buildings inhabited by infected persons. The name of the person and the disease is to be displayed for a certain number of days, according to the malady. In addition, a watchman may be stationed at the infected building.

The bill contains rules to prevent entrance of but few persons into an infected building, and for proper disinfection. Germicidal agents for these cases are prescribed, and careful regulations given for the details of disinfection. Persons who have convalesced from contagious disease must be thoroughly washed with soap and hot water, and sponged with acid solution of bichloride of mercury. When persons fail to disinfect premises the Health Officer is allowed to do so, and to collect the cost of this. Permits to leave buildings are necessary for persons who have been infected. Fines of not less than $5, nor more than $200, and imprisonment for from five days to six months are provided for violation of the act.

FLORIDA.—Hon. W. B. Henderson, President, Tampa; Joseph Y. Porter, M. D., State Officer, Jacksonville.

Florida Health Notes.—Official bulletins for the three months ending December 31, 1896: Mortality, 810 in a population esti-

mated at 391,422. There were 261 under five years of age. Annual death rate, 8.43. From consumption there were 98 deaths; typhoid fever, 24; diphtheria, 11.

ILLINOIS.—William E. Quine, M. D., President, Chicago; J. W. Scott, Secretary, Springfield.

Chicago, 1,619,226. William R. Kerr, Commissioner. Report for January: Deaths, 2,026—1,520 under five years of age. From diphtheria, 76; typhoid fever, 38; consumption, 187; pneumonia, 290; bronchitis, 172; measles, 13. Annual death rate, 15.

Feb. 6. Typhoid fever has become so prevalent at Evanston as to be almost an epidemic. It is thought there are 100 cases in the city, and every physician has from three to ten cases. At least a dozen students of Northwesten University are down with the disease. The cause is supposed to be impurity in the drinking water of the city, as after the heavy rains of three weeks ago the Health Department warned the people to boil the water before using. It was then said to be in a filthy condition. No cases of typhoid developed, however, until a week ago, and since that time numerous cases have been reported.

Diphtheria is epidemic in Deerfield.

INDIANA.—Douglass C. Ramsey, M. D., President, Mount Vernon; J. N. Hurty, M. D., Secretary, Indianapolis.

January 9. The Governor, in his message to the legislature, advises against the passage of the measure submitted by the State Board of Health for the thorough reorganization of that body. He thinks the scheme proposed is too complicated and costly, that substantially all the good it seeks to secure can be secured by a few simple changes in the present law. We trust the legislature will examine the board's recommendation and the reasons therefor, as well as the Governor's words, with great care. Certain it is that zymotic diseases which efficient sanitary regulations in other countries are able to control, so that epidemics are almost unknown, are causing hundreds of deaths and thousands of cases of sickness in the State every year. Improvements should be made in our health laws that really improve. In this connection it should be mentioned that the Governor recommends the adoption of a pure food law. This is rendered all the more necessary, as he well says, because other States have adopted laws against adulteration, and so the States where no such laws exist become the dumping ground for bad food.

Indianapolis, 165,000. Reports for 1896: 2,057 deaths, against 2,237 in 1895. The death rate is now 12.46, compared with 14.43 in 1895. Of diphtheria cases there were 359, with 60 deaths, against 494 cases and 114 deaths in 1895, which good showing is attributed to a stricter quarantine than heretofore. Of typhoid cases there were 369, with 68 deaths, against 112 deaths in 1895.

IOWA.—E. H. Carter, M. D., President, Des Moines; J. F. Kennedy, M. D., Secretary, Des Moines.

Davenport, 35,000.—A. W. Cantwell, M. D., Physician, reports for December: Number of deaths, 39—10 under five years of age. Death rate per 1,000, 13.4.

KANSAS.—T. E. Raines, M D., President, Concordia; T. Kirkpatrick, M. D., Secretary, Westphalia.

Topeka, Jan. 12: The Mayor's message recognizes excellent work by the Board of Health. And referring to the healthfulness of the State generally says: "As a rule, the health of the people of Kansas is good. As yet, we have never been subjected to a pestilence, like some of our sister States, and, in order to guard against a visitation of this kind, it would be well to encourage the work of this board. The report bears many suggestions which, no doubt, your committees on health and hygiene will consider. The reports, as far as they concern our State institutions, should be carefully considered and proper investigation made, to the end that the health of the inmates may receive the greatest protection possible."

KENTUCKY.—Joseph Matthews, M. D., President, Louisville; J. N. McCormick, M. D., Secretary, Bowling Green.

Covington, January 21: The sewerage of this city is reported to be in a condition dangerous to the public health. All of the traps emit an odor that is almost stifling to passers-by and that should not be the case if the refuse were being properly carried off. The trap in front of the Fourth Street Christian Church is simply a disease-breeding pit, and we cannot understand why the people who worship at that church have not taken forcible steps to compel the city to abate the nuisance. There are many others of the same order, and we have almost despaired of any improvement.

LOUISIANA.—R. S. Oliphant, President, New Orleans; G. F. Patton, M. D., Secetary, New Orleans.

New Orleans, 275,000—80,000 colored: Deaths in December, 636; colored, 245—153 under five years of age, 59 colored. Deaths

from consumption, 80; pneumonia, 48; bronchitis, 16; cholera infantum, 16; enteritis, 16. Death rates—Whites, 24.06; colored, 36.75: 27.75.

MAINE.—C. D. Smith, M. D., President, Portland; A. G. Young, M. D., Secretary, Augusta.

Skowhegan, Jan. 15.—An epidemic of scarlet fever has broken out in Athens, 12 miles from this place, and the town is under quarantine. Business is temporarily suspended, all schools have been closed by the Board of Health, and no services will be held in the churches on Sunday.

MARYLAND.—John Morris, M. D., President, Baltimore; John S. Fulton, M. D., Secretary, Baltimore.

Baltimore, 506,398—75,301 colored. James F. McShane, M. D., Health Commissioner, reports for January: The total deaths were 745, a decrease of 103 compared with the corresponding month of January, 1896. Of these 590 were whites and 155 colored; a death rate of 18.28 per thousand for the former and 24.80 per thousand for the latter. The death rate per thousand for the whole population was 17.66. 63 died from infectious diseases, 89 from consumption, 97 from pneumonia, 10 from influenza, 24 from bronchitis, 20 from Bright's disease, 56 from heart disease, 25 from nephritis, 23 from apoplexy, and 7 from typhoid fever. 225 or 30.20 per cent. of the total deaths were in children under five years of age.

Infectious Diseases Reported.—During the month of January, 315 cases of infectious diseases were reported, a decrease of 22 compared with the preceding month.

Feb. 6: Health Commissioner McShane went to Washington yesterday to consult with the Government officials with reference to the burlap and other bagging and old jute material which comes to American shipping ports on foreign steamers and against which Dr. McShane has been waging an incessant warfare for some time past. Stories in reference to the dangerous effect of this material have frequently appeared in "The American."

It is made principally from the bedding on immigrant ships, as well as the baggage and packing material from the same ships. It is cut up into slips in New York and elsewhere, and sold to shippers and commission men for covering oysters, fruit and vegetable barrels.

Dr. McShane wants the Government to pass more stringent laws in regard to the destruction of the material as soon as the ships come into port. He wants it burned by the health officers of the various cities bordering on the coast, instead of being thrown into the harbor or sold to dealers who make a specialty of trading in it. The law in Baltimore, passed at the instance of Dr. McShane, requires that a health inspector shall visit every incoming ship, have the bedding taken apart and loaded on a scow, together with all other bagging or waste material on the ship; taken to the old quarantine hospital station and burned.

MICHIGAN.—Hon. Frank Wells, President, Lansing; Henry B. Baker, M. D., Secretary, Lansing.

The Secretary reports for the month of January, 1897, compared with the preceding month, pneumonia increased in area of prevalence. Compared with the average for January in the 11 years, 1886-1896, erysipelas, consumption, diarrhoea and pneumonia were less prevalent.

Including reports by regular observers and others, consumption was reported present at 209 places, diphtheria at 94 places, measles at 77 places, scarlet fever at 63 places, typhoid fever at 42 places, and whooping cough at 37 places.

Reports from all sources show consumption reported at 7 places more, diphtheria at 9 places less, measles at 37 places more, scarlet fever at 22 places less, typhoid fever at 29 places less, and whooping cough at 4 places more in the month of January, 1897, than in the preceding month.

Detroit, 275,000. S. P. Duffield, M. D., Health Officer, reports for December: 357 deaths—149 under five years of age. Annual death rate, 15.28. Deaths from consumption, 20; pneumonia, 35; diphtheria, 57; typhoid fever, 6.

Much unseemly discord exists between this board and the Secretary of the State Board with regard to measles. Contrary to the sense of the State Board and other boards of health generally, the Detroit Board of Health maintains that measles is not a dangerous disease to the extent that an absolute quarantine is necessary; and that the course of the board of health in placarding houses is all that is required to protect the public health. Against this practice the Secretary of the State Board urges attention to the deaths from measles between 1876 and 1887, so far as they have been reported to the State Board, showing that in those years the

deaths from this cause exceeded the deaths from smallpox, and nearly equalled those from whooping cough. Then he asked that this be compared with the deaths from 1884 to 1893, during which years the deaths from measles far exceeded those from smallpox and were more numerous than from whooping cough.

The reason for this, he claimed, was on account of a wrong idea prevailing among the people in general to the effect that it was better for children to have the measles when they were young.

The "dead end" sewers, by agreement between the boards of health and public works, are to be flushed—that is to say, to be provided with flush tanks—and for this purpose an appropriation has been made. To be successful, they will have to be of a kind not hitherto brought to the notice of sanitarians. The appropriation will be wasted and the nuisance unabated by their use.

MASSACHUSETTS.—H. P. Walcott, M. D., Chairman, Cambridge; S. W. Abbott, M. D., Secretary, Boston.

Boston, 501,083. Samuel H. Durgin, M. D., Chairman of Board of Health, reports for October, 1896: Deaths, 879—290 under five years of age. From diphtheria (and croup), 60; typhoid fever, 34; scarlatina, 5; phthisis pulmonalis, 124; pneumonia, 77; bronchitis, 26. Annual death rate, 21.05. For month of November: Deaths, 815—260 under five years of age. From diphtheria (and croup), 66; typhoid fever, 23; scarlatina, 15; phthisis pulmonalis, 91; pneumonia, 70; bronchitis, 26. Annual death rate, 19.51. For month of December: Deaths, 917—268 under five years of age. From diphtheria (and croup), 52; typhoid fever, 14; scarlatina, 22; phthisis pulmonalis, 99; pneumonia, 129; bronchitis, 37.

For the year 1896, population estimated 516,305: Total deaths, 11,634—4,055 under five years of age; from zymotic diseases, 1,985; from diphtheria (and croup, 56), 572; scarlatina, 121; typhoid fever, 162; erysipelas, 30; measles, 27; whooping cough, 67; puerperal fever, 20; phthisis pulmonalis, 1,328; pneumonia, 1,387; bronchitis, 375. Death rate, 22.55.

Compared with previous years, there is a gratifying decrease of deaths from diphtheria—attributable to antitoxin treatment. In 1891 the percentage of deaths from it was 30.59 per cent. In 1892, 32.49 per cent. In 1895, when antitoxin first began to be extensively used, the percentage of deaths was reduced to 14.48, and during the year just closed it was but 11.14.

MINNESOTA.—Franklin Staples, M. D., President, Winona; H. M. Bracken, M. D., Secretary, St. Paul.

The startling announcement to sanitarians familiar with the work of this State Board, and with the work of Dr. C. N. Hewitt, its Secretary, from the date of its organization in 1872, is the retirement of Dr. Hewitt—by the Governor's refusal to reappoint him on the expiration of his term of office. To review the service of Dr. Hewitt to the State and what he has done for the promotion of the health of the people would be to give a summary of all that the board has done and the statistics of results, for in his capacity he has been pioneer as well as executive, to such a degree as to have the constant confidence, concurrence and support of his fellow-members of the board and the co-operation of nearly 2,000 local boards of health which he has been instrumental in organizing. The State is noted throughout the contry for the excellence and efficiency of its sanitary laws, drawn or suggested by Dr. Hewitt, based upon practical knowledge and extensive study of the sanitary laws and regulations of other communities. He was among the foremost in securing the co-operative notification of infectious diseases beyond as well as within his own State borders; in measures for the stamping out of tuberculosis in cattle; for the cultivation and use of pure vaccine virus; for the introduction of antitoxin treatment of diphtheria—in short, he has been in the front rank of the votaries of preventive medicine for the greater part of his official life, amounting nearly to a quarter of a century.

With Dr. M. H. Reynolds' appointment, a distinguished veteran, to membership of the board, no sanitarian has reason to find fault. It is eminently fitting that state boards should have such members. But the retirement of Dr. Hewitt was in no sense necessary to Dr. Reynolds' appointment. That the new Secretary and executive will prove efficient in following the way so well opened by his predecessor there is no room to doubt. Nevertheless, the dropping of Dr. Hewitt from the board is a loss to the State.

MISSOURI.—F. J. Lutz, M.D., President, St. Louis; Paul Paguin, M. D., Secretary, St. Louis.

The State Board of Health, as lately reorganized, is making ready to inaugurate a somewhat novel system of sanitative instruction to the public, especially of the large communities of the State, with reference to the character and prevention of communicable diseases. Among these diseases is consumption, in which popular interest has lately been aroused by the startling declaration of the

New York City Health Department regarding its contagiousness and the means which should be adopted to prevent its spread.

St. Louis, 600,000—35,000 colored. M. C. Starkloff, M. D., Commissioner of Health, reports for January: Deaths, 799—224 under five years of age. From diphtheria (and "croup"), 29; phthisis, 97; typhoid fever, 7; total from zymotic diseases, 73. Annual death rate per 1,000: White, 14.6; colored, 37.3: 15.9. Cases of communicable cases reported during the month, 239.

Following the example of New York, the board has declared consumption to be a communicable disease and directed that sanitary officers and physicians treat it accordingly.

MONTANA.—Helena, Jan. 27: During the last few weeks there have been a number of cases of typhoid fever reported in the city. It is attributed to the infection of the water at Rimini.

NEBRASKA.—J. V. Beghtol, M. D., President, Friend; F. D. Haldeman, M. D., Secretary, Ord.

Omaha, 140,452. Reports for December: Deaths, 78. Death rate, 6.6. Deaths from tuberculosis, 7.

Communicable diseases reported: Diphtheria, 40 cases, 7 deaths; scarlet fever, 15 cases, 1 death.

NEW JERSEY.—C. F. Brackett, M. D., President, Princeton; Henry Mitchell, M. D., Secretary, Asbury Park.

Newark, 230,000. Health Officer Chandler reports for the five weeks ending January 30: Deaths, 409—145 under five years of age; from diphtheria, 18; consumption, 45; pneumonia, 50. Annual death rate, 18.3.

Feb. 3: Numerous cases of diphtheria have been reported of late all over North Hudson, and deaths from the disease have occurred not unfrequently. There is good reason that these deaths are mainly owing to the fact that some doctors in North Hudson have no faith in antitoxin as a remedy for the disease and absolutely refuse to administer it in any case.

NEW YORK.—Daniel Lewis, M. D., President, New York; B. T. Smelzer, M. D., Secretary, Albany.

During the year 1896 there have been reported in the Monthly Bulletin 120,683 deaths—1,000 less than in 1895. Delayed returns, not recorded in the Bulletin, increase the actual reported mortality to about 124,000, which makes the death rate for the year 19.00 per 1,000 population; that of 1895 was 19.00; of 1894, 18.75;

of 1893, 19.30; of 1892, 20.78; of 1891, 21.43; and of 1890, 19.65. There was an average daily mortality of 340, against 336 in 1895: 324 in 1894, and 340 in 1893. In the Maritime district there was the highest death rate: 21.50, against 21.20 in 1895; in the Hudson Valley district, 19.00, against 18.70 in 1895; in the other sanitary districts from 13.00 to 16.35, or much the same as in 1895. The largest death rate was in July, 23.35, and the smallest in November, 14.75, as reported in the Bulletin; the summer death rate was 21.35; the winter, 19.00; the spring, 17.88; the autumn, 15.75.

The infant mortality was the same as the average of years past, 34.5 per cent. of the deaths having occurred under the age of five years. In the summer months, 41.1 per cent.; in the spring and fall, 30.5, and in the winter, 29.6 per cent. of the deaths occurred in early life.

The Zymotic mortality constituted 16.0 per cent. of the total deaths of the year, and caused 3 deaths per 1,000 population for the year. The percentages of several years past have been about 18.0 of the total deaths. Grippe was epidemic early in the year, and caused about 3,000 deaths. Typhoid fever caused 24.4 deaths per 100,000 population, the highest mortality being in the Hudson Valley and Southern Tier districts, 37.5, and in the Maritime district the lowest, 16.6 per 100,000 population. Diphtheria caused 71 deaths per 100,000 population, as compared with 78 in 1895, its highest mortality being in the Maritime district, and lowest in the West Central. Scarlet fever caused the lowest mortality in ten years; measles the highest, having been excessive for two years. Diarrhoeal diseases caused nearly the average of the past ten years, about 9,000 deaths. Consumption caused the usual yearly mortality of a little over 13,000 deaths, and a little more than 10 per cent. of the total. From acute respiratory diseases, deducting deaths from grippe, there were 14,000 deaths. The average mean temperature for the year was 4 degrees below the normal and rainfall was 38 inches, or normal.

For the month of December there were 9,074 deaths reported, an increase of 1,000 from November. The death rate for the month was 16.50, against 14.75 in November. There were 400 fewer deaths than in December, 1895. The increase over last month is in diphtheria, in acute respiratory diseases and consumption, with a moderate increase in deaths from all local diseases. Compared with December, 1895, there are 300 fewer deaths from acute respiratory diseases, which indicates that there has been no

prevalence of Grippe, at that time commencing to be mildly prevalent, although during this month cases of death from this cause have been reported; it has not existed sufficiently to impress the mortality, as it has in some years past, to a marked degree in December. Diphtheria caused 100 more deaths in November, but the increase was not greater than customary, since December is usually the month of its largest prevalence; it appears in all the sanitary districts except the Hudson Valley. Scarlet fever is not generally prevalent and caused fewer deaths than in ten years for December; of the 63 deaths, 51 occurred in the Maritime District. The total zymotic mortality and the infant mortality as well were unusually low. Consumption is reported as causing 1,002 deaths, 200 more than in November, but the average for this month. The temperature averaged 3.5 degrees below the normal with an average highest of 44 degrees and lowest of 4 degrees below zero. The rainfall was 1.40 inches, which was half the normal fall, and winds were generally westerly.

New York City, 1,995,000.—Report for December: Deaths, 2,819—900 under five years. Death rate, 16.85. Zymotic diseases, per 1,000, from all causes, 117.75; diphtheria, 158; typhoid fever, 36; consumption, 396; acute respiratory diseases, 443; diarrhoeal diseases, 44.

To Prevent Consumption.—January 19, the board adopted the following amendment to the Sanitary Code:

Resolved, That under the power conferred by law upon the Health Department, the following additional amendment to the sanitary code for the security of life and health be and the same is hereby adopted and declared to form a portion of the sanitary code.

Section 225. That pulmonary tuberculosis is hereby declared to be an infectious and communicable disease, dangerous to the public health. It shall be the duty of every physician in this city to report to the sanitary bureau in writing the name, age, sex, occupation and address of every person having such disease who has been attended or who has come under the observation of such physicians for the first time within one week of such time. It shall also be the duty of the commissioners or managers or the principal superintendent or physician of each and every public or private institution or dispensary in this city to report to the sanitary bureau in writing, or to cause such report to be made by some proper and competent person, the name, age, sex, occupation and last address of every person afflicted with this disease who is in their care or who has come under their observation within one week of such time. It shall be the duty of every person sick with

this disease and of every person in attendance upon any one sick with this disease, and of the authorities of public and private institutions or dispensaries, to observe and enforce all the sanitary rules and regulations of the Board of Health for preventing the spread of pulmonary tuberculosis.

The action of the board in this regard has been received with a welcome echo from progressive health authorities everywhere. The enterprising "New York Journal," of January 22d, publishes approvals from abroad, of Prof. Connet, representative of Dr. Koch in the management of the Institute of Infectious Diseases, and of Privy Counsellor Ehrlich, director of the Municipal Institute for management of serum, at Berlin; Dr. Symes Thompson, Chief Physician, Brompton Chest Hospital, and Dr. Klein, Bacteriologist, St. Bartholomew's Hospital, London.—It has also met the hearty approval of the health authorities in Boston, Philadelphia, Chicago, St. Louis and of many other cities in the United States, and several of them have promptly taken action—following the example.

Incompetent Midwives.—The Board of Health deservedly censured. January 26th: Coroner's inquest of a woman who was suffered to die of post-parteum hemorrhage, on account of the ignorance of a midwife in charge of the case. The Coroner said:

"There are dozens of such people as this midwife attending cases of childbirth in this city, and I think it is time something was done to prevent the lives of people being intrusted to their hands."

The jury's verdict declared that the woman died because of the incompetency of the midwife, and added:

"We censure the Board of Health for granting licenses without first examining applicants, and the jury recommends that Margaret Larthy (the midwife) be not allowed to practice any further."

The officers of the health board, when they heard of the censure, said that the Board did not license midwives. It registers them, though there is no law compelling a midwife to register. The Board will register any midwife who brings a diploma from a school of midwifery or a note from a reputable physician that she is competent.

It is certainly time that the Board of Health took action to secure such power as would prevent the practice of midwifery by incompetents.

Review of the work of the Board for 1896, from the Mayor's Message, January 19, 1897.

"The work of the Health Department during the year 1896 has

been unusually important and deserves special notice. The active and vigorous enforcement of the sanitary laws governing this city is indispensable to the health and welfare of its people, and a careful and discreet administration of the Health Department is necessary to secure compliance with regulations which are more or less burdensome and sometimes appear to be arbitrary and oppressive. Resistance to health laws, rules, and regulations is now of infrequent occurrence, and the orders for the abatement of nuisances, great and small, and for sanitary improvements, issued by the Health Department during the past year, numbering over 52,000, have mostly been promptly complied with.

"As it appears from the following table, the death rate has largely and gradually decreased since the organization of the Board of Health in 1866, and the death rate for 1896 is the lowest in the history of the city, being 21.54 per thousand:

1866. Death rate per 1,000..... 34.92
1876. Death rate per 1,000..... 27.11
1886. Death rate per 1,000..... 25.99
1896. Death rate per 1,000..... 21.54

"I have had prepared the following table, showing the number of deaths from contagious diseases during the past year, from which it appears that the death rate during the past year was smaller than in preceding years:

	'88.	'89.	'90.	'91.	'92.	'93.	'94.	'95.	'96.
Sm.-pox.	.05	.0006	.001	.001	.05	.06	.085	.005	.0005
Measles.	.39	.30	.45	.40	.51	.22	.32	.42	.37
Scarlet..	.89	.79	.25	.74	.57	.31	.30	.25	.21
Dipht'ial	.68	1.46	1.11	1.19	1.23	1.45	1.59	1.05	.91
Typhoid.	.24	.25	.22	.23	.23	.22	.18	.17	.15
Typhus.	.003	....	....	.0006	.03	.11	....	....	....
	3.25	2.81	2.03	2.55	2.62	2.38	2.47	1.90	1.64

"Only three cases of smallpox were reported in this city during the year 1896, none of these being of local origin. Three cases of typhus fever were reported during the last year, but no secondary cases occurred. The city is to be congratulated upon its comparative freedom from these fatal diseases.

"The regular semi-annual inspection of tenement houses was made by the sanitary officers of the Health Department in 1896, and the importance of this work is shown by the number of such houses, which is reported to be 42,542. There is a marked improvement in their sanitary condition. The regular and frequent inspection of tenement houses insures them from defects in plumbing and drainage, and in this particular they are frequently supe-

rior to private dwellings, which are only visited by sanitary officers upon notice or complaint. Many tenement houses have been ordered temporarily vacated until necessary repairs were made. Under the provisions of the tenement house act of 1895, the Board of Health was authorized and required, whenever, in its opinion, any building is for sanitary reasons so unfit for human habitation that the evils in or caused by said building cannot be remedied by repairs or in any other way except by the destruction of said building, to order the said building to be vacated, and may condemn the same and order it removed. Complying with this provision of the Statute, a careful inspection of rear tenement houses has been made, and eighty of them were ordered to be vacated, and proceedings ordered by the Board in the form prescribed by law for their condemnation and removal. The necessity for the destruction of some of the most extensive and unsanitary of these buildings having been disputed, and the powers of the Board to condemn and remove having been questioned, proceedings are now pending in the courts, and these buildings and the other rear tenements condemned remain vacant. Meantime, however, eight of them have been demolished by the owners, four altered for business purposes, and seven altered, or being altered, so that they will be fit for human habitation. The action of the Board in vacating and condemning rear tenement houses, as above stated, has stimulated owners of other tenement property to make many structural changes and improvements in order to avoid similar proceedings under the tenement house act.

"That part of the tenement house act requiring that the owner or lessee of tenement houses shall keep a light burning in the hallway upon each floor from sunset until ten P. M. has been enforced during the last year. Over 40,000 night inspections of tenement houses were made in March last, and over 14,000 orders were issued and served upon owners of premises delinquent in this particular. After reinspection notices of suit for penalty were served upon 5,630 owners for non-compliance with these orders. Upon subsequent reinspections it was ascertained that the law requiring the lighting of hallways in tenement houses at night had been complied with.

"Although the quality of the milk used in this city has been improved in recent years by frequent inspections and by prosecutions in the police courts, measures adopted by the Board of Health during the past year to prevent the sale of watered, impure, or adulterated milk having accomplished remarkable results. By an amend-

ment to the sanitary code adopted in January, 1896, the term 'adulteration' of milk was so clearly and fully defined that persons selling an impure article would hardly escape conviction and punishment. In June last an ordinance was adopted forbidding the sale or delivery of milk in the city of New York without a permit from the Board of Health, and subject to the conditions thereof, and additional ordinances were adopted extending this prohibition to the sale of cream and condensed milk without a permit. The permit system since inaugurated, and now in force, gives the Board of Health the necessary control of the milk supply of the city and greatly assists the inspecting officers in the performance of their duties.

"Measures have been inaugurated during the past year for the systematic examination of all milch cows within the city limits, with special reference to animals suffering from tuberculosis.

"I understand it to be a fact that tuberculosis in cattle is the same disease so fatal in mankind, and that the milk from such diseased animals is frequently the cause of this disease in those who consume it. The importance of an early diagnosis of this disease in milch cows and the prompt destruction of diseased animals is obvious. Of the 2,700 milch cows within the city limits, 1,139 have been carefully examined the past few months and the 'tuberculin test' applied. Of this number 186 were found to be diseased and were slaughtered, and the autopsy in each case confirmed the diagnosis. A detailed experimental investigation has been made during the past year in the bacteriological laboratory of the Board of Health into all the methods employed in various parts of the world for the production and preservation of vaccine virus, with satisfactory results. The vaccine virus now produced by the Board of Health is believed to be unexcelled by any in the world in potency, in lasting qualities, and in freedom from bacteria.

"The sanitary supervision of tuberculosis by the Health Department has resulted in a decrease in the death rate from that disease, which for the year 1896 is considerably lower than the average during past years.

"The services of the summer corps of fifty physicians during July and August were especially valuable on account of the extreme heat of the season. The medical advice, the free prescriptions of medicine, and the distribution of food and clothing, contributed by the charitable, were welcome and valuable to the poor and suffering. The infant death rate during the summer months

indicates faithful service by the medical officers of the Health Department, as well as the cleanliness and improved sanitary conditions in the city generally. During the extremely hot days of August 549 tons of ice was distributed to the poor of the city. The life-saving corps of the Health Department at stations on the North and East Rivers rescued fifty-three persons from drowning during the summer months.

The act to regulate the employment of women and children in mercantile establishments, passed in 1896, has imposed new and important duties upon the Health Department. Regular and frequent inspections of such places of business are required by this law, and all children between fourteen and sixteen years of age are required, before they can be employed, to have a certificate from the Board of Health to the effect that they have attended school for the prescribed period and are physically qualified for the service. The necessary corps of inspectors and clerks was appointed in September, and the duties imposed by this law have been fully complied with. Similar certificates for children employed in factories are required by chapter 891 of the laws of 1896, and have been issued by the Health Department since October 1.

"Upon the recommendation of the Board of Health and upon information and statistics furnished by the Health Department, an appropriation has been made for the year 1897 of an amount sufficient to employ the necessary number of medical inspectors to visit daily the public and private schools of the city for the purpose of detecting cases of contagious disease in their earliest stage, and placing them under observation, and to visit absentees from school to ascertain whether they are sick from contagious disease. It is confidently believed that this measure will reduce the number of deaths from contagious disease, protect the children of the schools from contact with those already sick, and in many ways promote the public health and welfare."

Brooklyn, 1,100,000.—Report for December: Deaths, 1,668—530 under five years. Death rate, 17.75. From zymotic diseases, per 1,000, from all cause, 126.75; diphtheria, 135; typhoid fever, 5; consumption, 208; acute respiratory diseases, 303; diarrhoeal diseases, 14.

More About the Filthy Bakeries.—We had occasion some months ago to refer to the Factory Commissioner's report with regard to Brooklyn and New York bakeries, and to the contradictory report of Sanitary Inspector Purdy, of the Brooklyn Health De-

partment, who pronounced the bakeries of this city throughout well ventilated and scrupulously clean. But now comes the report. Albany, Feb. 9, 1897: "State Factory Inspector O'Leary, through one of his deputies working in the city of Brooklyn, last week closed up five bake shops in that city, for their failure to comply with the provisions of the Bakery Inspection law. The State Department has been urging these places to comply with the requirements of the law, and their failure to do so has resulted in the closing of the shops.

"The height of these shops ranged from 5¾ feet to 6½ feet, and the sanitary and other conditions of the places were very bad. In one place inspected the deputy found ten men baking, sleeping and eating, all in one room, with no accommodations for their use at all. The proprietor of this place moved from New Jersey to this State three weeks ago.

"The inspector says the public know nothing about the condition in which many of these places are found. Only last week, in Buffalo, an inspector found a shop where they raised and prepared bread stuffs on the floor of the shop, and the floor was by no means a clean one.

"The department will not permit places of this character to exist after they are discovered. Mr. O'Leary says filthy, foul, unsanitary bake shops must go. The safety of the public health in the locality where they are found demands their abolition, and the department will do its full duty under the law looking toward the abatement of such nuisances."

Buffalo, 350,000.—Report for December: Deaths, 414—164 under five years. Death rate, 14.80. From zymotic diseases, per 1,000 deaths, from all causes, 217.40; diphtheria, 56; acute respiratory diseases, 92; consumption, 40; typhoid fever, 6.

Rochester, 170,000.—Report for December: Deaths, 212—52 under five years. Death rate, 14.94. From zymotic diseases, per 1,000 deaths, from all causes, 159.95; consumption, 21; acute respiratory diseases, 31.

Albany, 100,000.—Report for December: Deaths, 161—35 under five years. Death rate, 19.30. From zymotic diseases, per 1,000 deaths, from all causes, 100.00; typhoid fever, 1; diphtheria, 9; consumption, 23.

Syracuse, 100,000.—Report for December: Deaths, 139—42 under five years. Death rate, 16.65. From zymotic diseases, per

1,000 deaths, from all causes, 93; consumption, 15; acute lung diseases, 29; typhoid fever, 4.

At a recent meeting of the Syracuse Academy of Medicine, Dr. Van Dyne is reported as having said: "Our board of health is a board of politicians. As a board it knows little or nothing about the public health. Its members are in office because of political services by themselves or their friends, and their fitness for their appointment is in most cases their efficiency as second rate town politicians." This appears to have been said with reference to the interminable discussion and wrangle about the disposal of garbage and other questions of importance to the public health of the city, which, meanwhile, has been left to take care of itself.

Utica has a severe epidemic of measles.

Cohoes an epidemic of diphtheria.

Elmira is to be congratulated on having completed her filtering plant.

NORTH CAROLINA.—George G. Thomas, M. D., President, Salem; Richard H. Lewis, M. D., Secretary, Raleigh.

January bulletin summarizes reports from 26 towns, with aggregate populations of 84,672 white and 60,363 colored, for the month of December. Deaths, 80 white, 87 colored. Death rates, respectively: 11.3, 17.1, 13.8. The chief causes were: From diarrhoeal diseases, 14; consumption, 29; typhoid fever, 6; malarial fever, 5; pneumonia, 18.

OHIO.—S. P. Wise, M. D., President, Millersburg; C. O. Probst, M. D., Secretary, Columbus.

The annual report of the State Board of Health calls attention to the increased prevalence of diphtheria and typhoid fever in this State during the past year. The report suggests that bacteriological examination is of much importance in deciding the duration of quarantine in such diseases, and makes a plea for a State laboratory in the following language: "The time has now come when laboratories for chemical and bacteriological work must form part of the equipment of a progressive State Board of Health. Much of the work for the State at large could be done at a central laboratory under the direct control of the State Board of Health, but for many purposes laboratory assistance should be nearer at hand, and each of our large cities should provide a laboratory for its board of health. This will undoubtedly come, as the people are fast reach-

ing the conviction that money spent in the prevention of disease brings larger returns than any other form of investment."

The epidemic of diphtheria which has been prevailing in Ohio commenced, according to the report, the latter part of last August. There were reported to the board for the twelve months ending October 31, 1896, 3,019 cases and 746 deaths from this disease.

Unusual prevalence of typhoid fever is reported, commencing late in the summer and prevailing mostly in villages and rural districts where wells are in use.

Of smallpox the places infected, and number of cases which occurred during the year, were as follows: Bridgeport, 43 cases; Martin's Ferry, 68 cases; Pease, Pultney and Coleraine townships, Belmont county, 13 cases; Miltonsburg, Monroe county, and vicinity, 13 cases; East Liverpool, 2 cases; Lisbon, 2 cases; Zanesville, 5 cases; Dayton, 61 cases; Lima, 10 cases; Lockland, 1 case; total, 218 cases.

Toledo, 137,780: J. T. Woods, M. D., Health Officer, reports for December: Deaths, 125—30 under five years of age. Death rate, 10.88. Deaths from consumption, 16; diphtheria, 6; typhoid fever, 3.

Canton, Feb. 2.—There are over 100 cases of typhoid fever in this city. The cause is attributed to the water supply, and the board of health has advised precautionary methods.

Marietta, Jan. 7: An epidemic of diphtheria is prevailing at Byers, just this side of Chillicothe.

PENNSYLVANIA.—Pemberton Dudley, M. D., President, Philadelphia; Benjamin Lee, M. D., Secretary, Philadelphia.

Philadelphia, 1,188,793: Theodore B. Stulb, Health Officer, reports for five weeks ending January 30. Deaths, 2,519—739 under five years of age. From diphtheria, 171; typhoid fever, 48; consumption, 296; pneumonia, 462.

January 20.—The Board of Health to-day officially pronounced tuberculosis to be an infectious disease, and instructed physicians hereafter to report all cases of the disease within a week of the diagnosis.

No Pure Water in Sight Yet.—("Inquirer"), Feb. 9: Only the other day it was foul-smelling water we had. Now it is drinking water filled with mud! Mud! MUD! The freshets have started in. The snow away up in the country is melting. The ice is breaking up. The stuff that is carried into our reservoirs and into our water

pipes is mud. That is the kind of material that we have to drink, and bathe in, and to wash our clothes in.

All this could be easily remedied. We have but to lay down a filtration plant and filter our water to make it pure. We can get rid of the obnoxious odors. We can eliminate all the dirt. Every faucet in town could turn on pure water if we would but filter, and yet we do not do it.

The Combine and the Lobby Councilmen are at fault for this state of things, and the judges have decided that the Combine and the Lobby Councilmen are still on top. Pure water, under the circumstances, is not yet in sight.

Pittsburg, 280,000: Report for the five weeks ending January 30: Deaths, 465—162 under five years of age; typhoid fever, 15; consumption, 36; diphtheria, 17. Death rate, 17.12.

Jan. 11.—Feb. 7: Typhoid fever reported prevalent in Wilkesbarre, Lewisburg, Lewistown and Plymouth. Diphtheria in Pottsville, Shepton and Phinney. Measles in Reading and Mt. Carmel.

RHODE ISLAND.—A. G. Sprague, M. D., President, River Point; Gardner T. Swarts, M. D., Secretary, Providence.

Newport, Feb. 2: At the meeting of the Board of Health last evening the president, Dr. C. F. Barker, read the annual report for 1896. The whole number of deaths, not including still-births, for the year was 379. This is but a slight variation from the number for the last five years, being a little larger than in 1895 and 1893, the same as in 1894 and less than in 1892. With a population of 21,500 as given by the census of 1895, this gives the annual death rate of 17.1 per 1,000. But it must be remembered that the population of Newport is increased in summer by several thousands and therefore the death rate is apparently higher than it really is.

SOUTH CAROLINA.—Charleston, 65,165—white, 28,870; colored, 36,295. H. B. Horlbeck, M. D., Health Officer, reports for five weeks ending January 30: Deaths, 182—114 colored. Under five years of age, 48. Annual death rate—white, 24.4; colored, 32.6: 29.04.

For the year 1896, the deaths were 521 among the whites and 1,348 among the blacks and colored, a total of 1,869, a few in excess of the total of 1895, although there were fewer deaths among the white in 1896 than there were in 1895. The deaths from typhoid

fever were about the average for twenty years among the whites, and a slight increase among the colored—14 whites and 30 colored. There were 5 whites and 2 colored deaths from diphtheria and none from scarlet fever.

From diarrhoeal diseases there were 57 whites and 171 colored. Every year in Charleston there is a large mortality from diarrhoeal diseases, due in great measure to improper and unwholesome food. We have recommended from year to year that a food inspector should be appointed, whose sole business it should be to visit every day the various markets, and who should be empowered to destroy all food supplies that are offered for sale that are unfit and unwholesome. We renew the recommendation as an important necessity for general health of the city.

Quoting from our report for the year 1895 we say: "These deaths are strictly, to a great extent, preventable and occur from improper and unsound and unfit food. This death roll justifies our constant recommendation that there should be some inspection of the food supply of the city."

TENNESSEE.—J. D. Plunkett, M. D., President, Nashville; J. Berrien Lindsley, M. D., Secretary, Nashville.

The Secretary's bulletin reports the principal diseases, named in the order of their great prevalence in the State, for the month of December, were: La grippe, lung diseases acute, typhoid fever, consumption, malarial fever, whooping cough, measles, diphtheria, rheumatism, scarlet fever, croup, and chickenpox.

Memphis Board of Health reports for December, deaths, 123—53 white and 70 colored. Of these 33 died of general diseases, 4 of nervous diseases, 10 of circulatory diseases, 24 of respiratory diseases, 12 of digestive diseases, 14 of other local diseases, 2 of developmental diseases, and 9 from other causes.

For the year 1896, the deaths were 629 white, 719 colored. The death rate 23.94.

VERMONT.—C. S. Caverly, M. D., President, Rutland; J. H. Hamilton, M. D., Secretary, Richford.

Burlington, Jan. 14: The State Board met here to-day. The chief subject of consideration was the outbreak of typhoid fever at St. Johnsbury. On the report of Dr. Hamilton the facts in regard to the outbreak seem to warrant the opinion that it is due to the Passumpsic river water, which is supplied to about one-half of the village. The Passumpsic river carries the sewage of Lyndon, Lyndonville and St. Johnsbury Centre.

The authorities of Burlington, including the health officer, mayor and health committee of the board of aldermen, appeared before the Board in reference to the matter of cleaning and disinfecting certain premises of the city which had been infested with diphtheria. Dr. Holton was continued as a committee to formulate rules and regulations regarding the lighting and heating and ventilation of school houses.

The registration law was discussed, and it was the opinion of the Board that its thorough enforcement will result in a great improvement in the vital statistics of the State.

WASHINGTON.—Seattle, Jan. 26: Dr. R. M. Eames was elected health officer to succeed Dr. F. S. Palmer, resigned, yesterday afternoon. Dr. Palmer submitted his report for the year 1896.

There were 436 deaths reported, as compared with 467 in 1894 and 425 in 1895. The average number of deaths per year for the four years 1891-1895 was 475, so it will be seen that the number for the past year, 436, is considerably below the annual rate. The annual death rate per 1,000 population, computed on an estimated population of 60,000, was 7.26. There were 560 births reported, not including 43 still births, being a considerable increase over the previous year, when 462 births, not including 50 still births, were reported.

WEST VIRGINIA.—W. P. Ewing, M. D., President, Charleston, N. B. Baker, M. D., Secretary, Martinsburg.

Wheeling: Health Officer Jepson reports for the year 1896: Deaths, 457. The main causes were: Consumption, 61; pneumonia, 37; scarlet fever, 30; measles, 23; typhoid fever, 22; heart diseases, 21; accidents, 21; apoplexy, 17; kidney diseases, 17; diphtheria, 10. Estimating the population as a year ago, at 38,000, last year's mortality was only twelve deaths per thousand people, or 2.28 per thousand below that of 1895.

WISCONSIN.—Solon Marks, M. D., President, Milwaukee; U. O. B. Wingate, M. D., Secretary, Milwaukee.

Milwaukee, 260,000: Walter Kempster, M. D., Commissioner of Health, reports for December: Deaths, 345—144 under five years of age. From diphtheria, 25; consumption, 35. Annual death rate, 15.92 per 1,000.

THE CARE OF EPILEPTICS.—"The Third Annual Report of the Board of Managers of Craig Colony to the State Board of Charities for the fiscal year ending September 30, 1896," gives an interesting

account of what has been accomplished by the managers of an excellent and praiseworthy institution. In Craig Colony a number of epileptic patients, who would otherwise be thrown upon the charity of the State as inmates of almshouses or the hospitals for the insane, are clothed, fed and cared for, and encouraged to perform such light and suitable work as will make them, to a certain extent, self-supporting. Of the 145 patients admitted since the informal opening in February, 1896, nearly every individual has shown marked physical and mental improvement, and although held by no legal form of commitment, and having perfect liberty of the premises, only five have attempted to escape, of whom two were brought back within twelve hours and two returned voluntarily. The colony last year produced about 50 per cent. of its cost of maintenance, and, in view of the pressure brought to bear on the managers for the admission of more patients, and of the fact that there are to-day hundreds of these unfortunates in the almshouses and at least two hundred and fifty in the hospitals for the insane, who are capable of enjoying the freedom and taking part in the benefits of colony life, the managers ask the State Board for an increase in the appropriation fund. This increase, if granted, will enable them, by building more dormitories, to diminish the cost per capita of maintenance, and by enlarging their agricultural and industrial plant to increase their production and so become more nearly self-supporting.

THE LONGEVITY OF LONG ISLANDERS, as summarized by a correspondent of the "Brooklyn Eagle," recently, is a good illustration of the healthfulness of the ocean atmosphere, to which the atmosphere of Long Island, being but little above sea level and constantly swept by winds from the ocean, so nearly approaches. We had occasion several years ago (Vol. 23) to pointedly refer to these conditions as expressed by the inhabitants of Turk's and Cacoes Islands. Patchogue, situated on the south side of Long Island, almost at sea level, according to recent census contains about 5,000 inhabitants, there were found among them 135 white persons 70 years of age and over, the oldest, aged 93 years. Of these, 69 are males and 66 females and 125 are American born.

Their aggregate ages figure up to ten thousand four hundred and ninety-four years, averaging about seventy-eight years each. All but a few of these aged people are enjoying perfect health, and not a single one of these septuagenarians is supported by the

town. Nearly all of them have lived in Patchogue their entire lives. There are, besides, over 300 between 60 and 70 years of age, nearly half of whom are 65 years and over. All enjoy good health.

PLAGUE STATISTICS at the latest date. Bombay, Feb. 18, 1897: Since its outbreak there have been 6,853 cases and 5,447 deaths from the disease in this city, and in the entire Bombay Presidency 9,911 cases and 8,006 deaths.

The Plague Congress at Venice, which assembled February 16, seems by the latest announcement at the time of closing up this number, February 19, to have concentrated its deliberations into the conclusion that each government should institute and maintain its own quarantine measures to prevent the importation of the plague. The short of which is, that, no restriction has been placed upon the exportation of rags—which appears to have been the chief subject of discussion—and that England's commerce in them is not to be interfered with. Dr. Thorne stated that thousands of bales of infected rags have been sent to foreign ports from Egypt, having been handled by men affected with the plague. The disease, having been in houses whence came these rags, had never, he said, transmitted the plague. The Dutch delegate was of the same opinion. They will vote together to put no restrictions on trade in rags. France, Austria, Italy and Germany were against them.

THE BACILLUS OF YELLOW FEVER is announced as the most recent biological discovery. This time, by Dr. Guiseppe Sanarelli of Montevideo, who, the London "Standard" of January 1, tells us, is a man not yet thirty years of age. He took a degree in the University of Siena in 1889, and was afterwards successful in several competitions in Italy and abroad, continuing his studies at Pavia, and also in Paris and in Germany. He devoted himself especially to the study of maladies diffused by the supply of impure water, notably typhoid and cholera.

In these branches Dr. Sanarelli worked with extreme ardor. He made special studies at the Pasteur Institute of the Siene water, and of the water supply at Versailles, during the winter months, when there was no suspicion of any alarm of cholera, and succeeded in isolating the vibrion of cholera, and in finding the cause of its relative harmlessness. These researches at Paris first brought him into notice. On his return to Italy he was appointed to the chair of hygiene in the University of Siena, and soon afterward the

University of Montivideo, having decided to found a great institute of experimental hygiene, in imitation of that of Pasteur, offered him the direction of it, with a salary of £1,000 a year and other advantages.

Sanarelli, whose stipend at Siena was just £50 per annum, hesitated. He did not wish to leave Italy; he had asked in vain from the then Minister of Public Instruction some advancement, and it is probable that, had he succeeded in obtaining a post of £120 a year, he would still be teaching at Siena; but, urged by his friends, he at last closed with the offer from Montevideo, and, having provided himself in France and Germany with the scientific material necessary for setting up a cabinet of experimental research, he set forth. In less than a year the institution directed by him has come to be in a most active and flourishing condition, and now enjoys the envied distinction of being the first to have under cultivation the bacillus of yellow fever.

It is to be hoped that this discovery may be verified on further researches and not turn out to be like several others that have preceded it—a mistaken serum.

ANTI-RINDERPEST SERUM.—Berlin, Feb. 6.—Dr. Koch, the eminent German bacteriologist, has telegraphed here from Cape Town that he is returning home with a newly discovered serum, which will lessen the force of rinderpest. In the meantime, he says, he is unable to say whether or not he will be able to prevent animals from being infected with the disease. He has demonstrated that sheep and horned cattle are the most liable of all animals to contract the disease, and that dogs, monkeys and rodents enjoy complete immunity from it.

THE ANTI-PLAGUE SERUM.—Bombay, Feb. 3.—It is announced that the Government has decided to make use of the anti-plague serum, the efficacy of which as an antidote for the bubonic disease which is ravaging Bombay and other parts of India was discovered by M. Yersin, a French scientific man. M. Yersin is now on his way to India.

OBITUARY.

DR. HENRY HARTSHORN.—A dispatch received at his home, in Philadelphia, from Tokyo, Japan, announces the death of Dr. Henry Hartshorn, in that city, February 10, 1897. Dr. Hartshorn

was born in Philadelphia, March 16, 1823. He was educated at Harvard College, whence he graduated in 1839; and obtained his medical degree from the University of Pennsylvania in 1845. He was elected professor of the institutes of medicine in the Philadelphia College of Medicine in 1853; consulting physician and one of the lecturers on clinical medicine in the Philadelphia hospital in 1855. In 1858-'59 he traveled extensively abroad, and on his return home in 1859 he was elected professor of the practice of medicine in the Pennsylvania College, to fill the vacancy occasioned by the resignation of Prof. Stille. In 1862 he was designated professor of anatomy, physiology, natural history and hygiene in the Philadelphia Central High School. In 1866 he was elected to the professorship of hygiene in the University of Pennsylvania, and in the next year made professor of organic science and philosophy in Haverford College. He also held at different times professorships in the Pennsylvania College, dental surgery in Girard College, and the Woman's Medical College of Pennsylvania; and was visiting and consulting physician to several hospitals. He was an industrious student and writer. His first published essay to attract attention was his graduating thesis in 1846, on Water vs. Hydropathy. He was the first person to ascertain by experiments on himself and others in 1848 the safety and effects of the internal use of chloroform. Among his earlier monographs was "Cholera: Facts and Conclusions as to the Nature, Prevalence and Treatment," on account of which he first made himself known to the readers of THE SANITARIAN, by taking exception to its criticism on that brochure and by the prediction in 1873: "That within twenty years, the now common notion that the principal, if not exclusive, mode of migration of cholera is, by communication from person to person, through the stools of cholera patients, will come to be remembered only as the obsolete *ism* of a period, etc. (SANITARIAN, Vol. I., p. 283.) He was the author of several volumes, as well as numerous essays, on medical and sanitary subjects, and a frequent contributor to periodical literature. Those most worthy of mention are: "Essentials of the Principles and Practice of Medicine;" "A Conspectus of the Medical Sciences;" "Essays on the Arterial Circulation;" "Glycerine and Its Uses," and a number of important articles in Johnson's New Illustrated Cyclopaedia (1872-'73). He also edited, with considerable additions, the American edition of Sir Thomas Watson's "Lectures on Practice of Medicine," which task was so well performed as to call forth a very kind and favorable acknowledgment from the distinguished author of the lectures to Henry C. Lea, the publisher, of Philadelphia.

BOOK REVIEWS.

INDEX-CATALOGUE OF THE LIBRARY OF THE SURGEON-GENERAL'S OFFICE, U. S. A. Authors and Subjects. Second Series. Vol. I. A. Azzuri. Washington: Government Printing Office.

This volume is in thorough keeping with the volumes of the first series. It is conducted by D. L. Huntington, Deputy Surgeon-General, and Lieut. Col. U. S. Army. It includes 6,346 author titles, representing 6,137 volumes and 6,327 pamphlets. It also contains 7,884 subject titles of separate books and pamphlets and 30,384 titles of articles in periodicals.

REPORT OF THE COMMISSIONER OF EDUCATION, 1894 and 1895. 2 Vols. Pp. 2370. Washington: Government Printing Office.

These volumes are prolific in everything that appertains to the status of education in the United States and so much of the status of education abroad as serves to show the respective advantages. The enrollment of the schools and colleges, public and private, of all classes during the year was 15,688,622—an increase of 158,354 over the previous year—of all these there is a detailed classification showing the numbers respectively of elementary schools, secondary schools, and the various institutions of higher education; the number in schools supported by public funds and taxation, and the number in private institutions. The percentage of the total population enrolled in public schools was 20.65—.12 increase over the previous year. It is interesting to notice that in the eight States that lead in the average amount of education to each inhabitant, Massachusetts gives 8.04 years; Connecticut, 7.31; New York, 6.83; Rhode Island, 6.76; Ohio, 6.59; Iowa, 6.33; Illinois and New Jersey, 6.29. There were 80,839 students in *normal schools*, pursuing training courses for teachers. Of this number about 12,000 per annum may be counted as graduates. To supply the places made vacant in a corps of 400,000 teachers, besides filling the positions in new schools opened during the year, upward of 60,000 are required. *Of Universities and Colleges* (Higher Education) the total number reporting, for both sexes, was 481—representing every State and Territory. The number of instructors reported by these institutions was 11,582; the number of students, 149,939. *Schools of Technology*, exclusive

of departments in universities and colleges, 51—with 1,217 instructors and 13,896 students. *Professional Schools:* 149 theological, with 906 professors, 8,050 students, 1,598 graduates; Law Schools 72, 8,950 students, 2,717 graduates; medical schools, 151—113 regular, 20 homoeopathic, 9 electic, 2 physiomedical, and 7 graduate (?); 22,887 students, 18,669 in regular schools, 1,875 in homoeopathic, 732 in electic, the number constantly increased notwithstanding the more rigid requirements and the extension of the term of study. Of special interest, in relation to medical schools, is an abstract of Dr. Marcel Bandouin's report to the French Government: Dr. Bandouin was delegate from the French Government to the Chicago Exposition and specially commissioned to study the system of medical instruction, conditions of professional life, etc., in the United States. He visited the chief medical schools, hospitals, etc., of the country and described them in detail. The Commissioner gives an abstract of his report in so far as it relates to some typical schools and other institutions. The Johns Hopkins Hospital is represented as being well-nigh incomparable with any institution in Europe—the Urban Spilal at Berlin being the only one that can at all compare with the Johns Hopkins. "Our French hospitals," he says, "are built on a very different plan, which their antiquity readily explains. Those that have been recently constructed, whether at Paris or in the provinces, may be as good and as interesting as the two mentioned, but certainly they do not compare with them either in extent or in perfect hygienic resources, or in the perfect, harmonious arrangement of all the parts." The excellencies of the Woman's Medical College of Pennsylvania, the University of Pennsylvania, Roosevelt Hospital, New York, School of Medicine of Yale University, the Boston City Hospital, the McLean Hospital, Cornell University, "Ann Arbor even more than New Haven is the typical university city of America," and some others, are designated in such terms as should be eminently gratifying to their sponsors. Of Schools of Dentistry there are 45, with 534 students—an increase of over 2,000 in five years; Schools of Pharmacy 39, with 3,859 students—an increase of 1,000 in five years; Schools for Training Nurses 131, while the number in 1890-91 was only 34. Chautauquan Education is considered in a special monograph by Prof. H. B. Adams, as a peculiarly American phase of university extension, especially commendable as summer school work. *Hygiene* is not even referred to—or if so it is not indexed—as a subject of instruction in American schools,

nor is any allusion made to the study of stimulants and narcotics which has superseded the study of hygiene in the State of New York, by act of the legislature. Not so abroad, however. In the Chapter on Education in Central Europe, we learn that, in Prussian cities, hygiene most frequently receives ample consideration. In the highest grade of advanced schools in Posen, hygiene and political and domestic economy, receive special attention under the heads of language, arithmetic, nature study and history. In Hessia, natural history, in the highest grade for people's schools. treats of the "structure and life of the human body and laws of "health." Restriction of space forbids a more extended review of this report, replete in practical knowledge which no educator who takes pride in his profession can afford to do without, and for its availability in this regard it should have the widest possible distribution among the school authorities throughout the country. The section on *Mental Fatigue in Schools* is so pertinent to, and is such an admirable condensation of the conclusions of the highest authorities on the subject that we give it entire on other pages of this number.

REPORT ON PUBLIC BATHS AND PUBLIC COMFORT STATIONS, BY THE MAYOR'S COMMITTEE: WILLIAM GASTON HAMILTON, C. E., MCREAU MORRIS, M. D., AND WILLIAM HOWE TOLEMAN, Ph. D. Pp. 200, Illustrated. New York, 1897.

The work of this committee began under the auspices of the "Committee of Seventy," six years ago, to whom it had reported when in July, 1895, William L. Strong, having become Mayor, appointed the same men as an "Advisory Committee" to continue the study of the subject of Public Baths and Public Comfort Stations. The committee's previous report, in pamphlet form, had attracted wide and favorable attention and materially promoted legislation on the subject.

Fully sensible of the great need of free public baths in the city of New York—with not a single one open the year round and without any examples in other American cities—the committee extended its scope of inquiry by personal investigation and actual examination of public baths abroad. The gist of the result of its inquiries is expressed in this volume. It is an admirable condensation of extensive information on the subject, and with its numerous and excellent illustrations is the best exhibit of practical knowledge on public baths and public comfort stations hitherto published. It comprehends an account in detail of all that has been done in the

city of New York for the health and comfort of the people in this regard; shows the avidity with which the benefit has been received by the public; its insufficiency and the pressing necessity of extending it. The structures thus far completed are described, with illustrations, and records of their use adduced—with which readers of THE SANITARIAN, through recent contributions to its pages, are to some extent already familiar. The public baths, wash houses and comfort stations of other cities, and the extent to which they are used are also described, and should not fail to encourage their extension.

OYSTER CULTURE IN RELATION TO DISEASE. (Supplement to Twenty-fourth Annual Report of the Local Government Board, 1894 '95.) London, 1896.

There has been a good deal of somewhat sensational and wholly unjustifiable reference to and comment on this report, which we are glad to have received. While it contains abundant justification of the investigation, it very thoroughly demonstrates that the oyster is much more sinned against than sinning. It clearly shows that oysters in England and in France, as in the United States, are liable to take up typhoid fever germs, and that they have actually caused typhoid fever. Because, as Dr. Bulstrode shows, in many places oysters are exposed to the risk of contracting and therefore of conveying the disease. They are placed for fattening in shallow water near the foreshore, and so close to sewer outfalls as to be pretty constantly bathed by sewage. The worst places in this respect in England are Southend, Grimsby, Shoreham, and the Isle of Wight. On the other hand, Whitestable and several other famous beds are beyond suspicion, while a third class is only theoretically open to danger. But the most comforting point brought out by the report is that even in the worst cases the danger can be removed without difficulty; by prohibiting the planting of oysters in dangerous places and by prohibiting the discharge of sewage into waters already appropriated to oyster culture.

LABORATORY CALCULATIONS AND SPECIFIC-GRAVITY TABLES. By JOHN S. ADRIANCE, A. M., Analytical Chemist to the Nursery and Child's Hospital and the New York Infant Asylum, Fellow of the London Chemical Society, Member of the Society of Dyers and Colorists, Member of the Society of Chemical Industry, Member of the American Chemical Society, Fellow of the American Association for Advancement of Science, etc. Third Edi-

tion, revised and enlarged. 12mo., cloth, $1.25. New York: John Wiley & Sons. London: Chapman & Hall, Limited. 1897.

The favor with which this book has been received heretofore is shown by the need of this third edition. The author repeats that his aim has been to offer to the student, as well as the analytical chemist, a substitute for much of his laborious calculations. For this purpose all the tables which were used in the former editions have been enlarged and others added. All calculations have been made with the greatest care, so that they may be thoroughly depended on in every particular.

NOTES FOR CHEMICAL STUDENTS. By PETER T. AUSTEN, Ph. D., F. C. S., Professor of Chemistry in the Polytechnic Institute of Brooklyn. 12mo, cloth. $1.50. New York: John Wiley & Sons. London: Chapman & Hall, Limited.

This book, the author tells us prefatorily, is a rewriting of his "Chemical Lecture Notes," published some years ago, from which he has eliminated all redundancy and to which he has added whatever has appeared to him to be best suited to aid the student to overcoming the difficulties in acquiring chemical knowledge—to which it appears to be well adapted.

NEW YORK STATE COMMISSION IN LUNACY. Seventh Annual Report, for 1895.

An elaborate report of nearly 900 pages, which besides the detail of the care of over 20,000 insane, as now enumerated, in the State, discusses the subject of the State care of the insane system, its advantages and needs; the exempted county system; Licensed Private Institution system; and General Asylum system; followed by a summary of recommendations and statistics. With regard to the alleged increase of insanity: "So far as the commission is able to see, the current notion that insanity is increasing out of proportion to the normal increase of population, has little, if any, real basis to rest upon. This view of the question is sustained by recent observations of the lunacy commissioners of England and Scotland." A very considerable portion of the report is taken up with tabulated statistics, but so diffuse as to be impracticable, except for small portions of the whole number reported upon. For example: turning to heredity, as indexed, 1,813 cases only are summarized, of which 482 are recorded as transmissible. Again, of inebriety: the number of inebriates received into and discharged from several hospitals, insane or otherwise, is given, without reference to transmissibility,

or proportion of insane attributed to this cause. "Causes" refers to Kings County Lunatic Asylum only, during the year ending Sept. 30, 1895, and since October, 1888, 515 and 3,614 respectively. Of these 4,129, the chief assigned causes were: Intemperance, 499; senility, 295; worry, 290; epilepsy, 199; masturbation, 109; puerperal, 92; ill health, 66; injury, 64; religion, 60; heredity, 63; overwork, 49. It is a volume of considerable information, but very heterogeneous.

CONTEMPORARY LITERATURE.

DENSITY OF POPULATION.—In the February "Century" is a paper by Mrs. Schuyler Van Rensselaer on "Places in New York," in the course of which the author says: Cross the Bowery now, and you will enter the famous Tenth Ward—a true tenement-house district, forming part of the most crowded city quarter in all the world. As a whole, the city of New York below the Harlem River (the Island of Manhattan) is more densely peopled than any other city in the world, counting 143.2 persons to the acre, while Paris counts 125.2. Then one-sixth of the entire population of all New York (reckoning now with the parts above the Harlem too) is concentrated upon 711 acres of ground. Here, on the lower East Side of our town, in the summer of 1894, there dwelt some 324,000 souls, averaging 476.6 to the acre; and a certain section of this great area—the Tenth Ward—showed a local acre-average of 626.26. The most thickly peopled spot in Europe is the Jew quarter in Prague; but it is only one-fifth as large as our Tenth Ward, while it shows a density scarcely greater than that of the whole of the 711 acres in which the Tenth Ward is contained—485.4 per acre. Nor is this the worst that our 711 acres can reveal. Sanitary District A of the Eleventh Ward (bounded by Avenue B and Second street, Columbia, Rivington and Clinton streets) contains 32 acres, and in the summer of 1894 each of them bore 986.4 human beings. This is the very thickest, blackest coagulation of humanity in all the known world. No European place of anything like the same size even approaches it, and its nearest rival is a part of Bombay where the average population over an area of 46.06 acres is 759.66.

Yet it should be remembered that, while our acres are thus more heavily burdened than any others, places can be found in European, as in Asiatic, towns where people are more uncomfortably crowded

within doors. There the houses are low. But New York tenements are very lofty, and thus our floor-space to the acre is much more extensive. Moreover, although we are now more crowded than ever before, our sanitary state steadily improves. During the decade which closed with 1874 our death rate was 30.27 per thousand; during the one which closed with 1894 it was 24.07.

"CONDEMNATION OF CRIMINALS NOT PUNISHMENT."—All men of a scientific turn of mind who have made a study of criminal anthropology are fast approaching the physician's position regarding such questions. Every criminal is more or less a diseased portion of the body politic: some can be saved, some must be removed, and some must be destroyed, but the notion of punishment should not complicate the judgment in deciding what disposition is to be made in either case. The insane were formerly regarded with feelings of hatred and vindictiveness, but to-day this is only a shameful recollection. With the advance in the study of criminology and the more merciful era of humanitarianism that must follow, the like sentiments toward the criminal will be eliminated from our courts of justice. Prof. Austin Flint, the distinguished President of the New York State Medical Association, in his annual address to the association said: "Scientific progress will lead us finally to abandon the ancient idea of punishment of crime, and substitute for it treatment and correction." Quetelet writes, "Every society has the criminals that it deserves."—Edward F. Brush, M. D., in "Appletons' Popular Science Monthly" for February.

THE "REVIEW OF REVIEWS" for February makes "A Plea for the Protection of Useful Men" from bores and "societies," and all well-meaning people who bother the life out of public men by letters and calls on the pretext of seeking assistance in some worthy undertaking. The editor of the "Review" publishes letters on this subject from the late Gen. Francis A. Walker, written only a few weeks before his death. In one of these letters General Walker wrote: "I am not well, and neither callers nor correspondents have any mercy."

By far the most complete account of the many-sided career and public services of the late Gen. Francis A. Walker that has appeared anywhere since his sudden death early in January is published in the February "Review of Reviews." A character sketch by Joseph J. Spencer reviews General Walker's life as a student,

lawyer, soldier, adjutant-general on Hancock's staff, journalist, teacher, Government statistician, census commissioner, writer on economics, historian and educational administrator. Prof. Davis R. Dewey treats in more detail of General Walker's services in the army, as head of the census bureau, as a political economist, and as president of the Massachusetts Institute of Technology, and discusses particularly President Walker's relations to the monetary questions of the day. The articles are illustrated with portraits of General Walker at different ages.

THE "LIVING AGE" has never needed any "New Features" to commend it to the best class of readers, yet it must be conceded that the additions recently made are real improvements.

Without yielding a particle of its old conservatism, adhering as strictly as ever to its purpose to admit nothing but the choicest selections to its columns, it has shown a wise judgment in entering new fields, thus extending its scope and increasing its usefulness.

Late issues of this eclectic have been enriched by many valuable productions, selected not from the British press alone, but embracing translations from leading Continental authorities, including Emilio Castelar in a review of the Spanish-Cuban relations, a paper on de Goncourt, and a discussion of "Political Ideals and Realities in Spain"; Jules Lemaitre on a "Modern Morality"; Alfred Fouille in "As Others See Us," and Anatole le Braz in "All Souls' Eve in Lower Brittany.

The "Monthly Supplement," giving Readings from American Magazines, Readings from New Books, and a List of the Books of the Month, adds a valuable feature which readers will be quick to appreciate, and with the translations from eminent continental authors, on prominent questions of the day, fairly doubles the value of the magazine which, before these additions were made, was well worth the subscription price of $6.00 a year. The Living Age Co., Boston, are the publishers.

"GOOD HEALTH" is in a good deal better health since the beginning of the year, for having dispensed with much surplus tissue. The reduction of its external dimensions is fully compensated by its internal solidarity. It always contains a tempting dietary for the sanitary appetite—excepting oysters, which it holds inexcusable for not running away from man's wicked devices.

"Medical Review" is now "Medical Review of Reviews," an admirable following, in so far as it takes after that "Review of Reviews" conducted by Albert Shaw, necessary to every reader who

would keep abreast with the progress of the world. But we confess to some disappointment at not finding SANITATION among the specially classified subjects of review. Is it because there was nothing of the kind on the editor's table when he made up the January number?

ALBANY MEDICAL ANNALS has clothed itself. It evidently feels better, it looks better and *is* better. It is a good deal better fed recently, and its company proportionately more enjoyable; and surely it ought to be all this, with the Alumni Association of the Albany Medical College behind it and the Bender Hygienic Laboratory to work in. Thus appointed and euipped, it is no better than it should be—but it is growing.

AMERICAN MEDICO-SURGICAL BULLETIN has been splitting the difference—has followed the example of our much esteemed Virginia Medical Semi-Monthly, which reached the same grade from an opposite direction some time ago. And here, by the way, be it remarked, the VIRGINIA MEDICAL SEMI-MONTHLY contains a larger proportion of original contributions than any exchange that comes to our table. And the "Semi-Monthly American Medico-Surgical Bulletin," the best excerpt. Its new editor is an admirable skimmer—he knows good cream and gives it.

THE AMERICAN MONTHLY MICROSCOPICAL JOURNAL has changed its dress for the better. Its biological embellishment is beautifully significant of its researches and ever broadening field of view and its always entertaining revelations.

E. B. Treat, Publisher, New York, has in press, and nearly ready for issue, the INTERNATIONAL MEDICAL ANNUAL for 1897, being the fifteenth yearly issue of that well-known one-volume reference work. The prospectus shows that the volume will be the result of the labors of upwards of forty physicians and surgeons, of international reputation, and will present the world's progress in medical science.

The value of the work will be greatly enhanced by the thoroughness of illustration, both colored plates and photographic reproductions in black and white will be used wherever helpful in elucidating the text.

"To those who need the condensed and well-arranged prepresentation of the medical advances of the past year—and this class must necessarily include all physicians—we heartily commend the 'International Medical Annual.'"

The volume will contain about 700 pages. The price will be the same as heretofore, $2.75. Full descriptive circular will be sent upon application to the publisher.

THE TENNESSEE EXPOSITION.

The Tennessee Exposition at Nashville, to be opened May 1, promises to be not only national, but international, for it is already receiving recognition from many of the leading cities and from more than thirty States and also from various foreign countries.

The directors and managers of the enterprise are leading business men and the foremost women of Tennessee. They have been chosen without regard to political affiliations, and solely on account of their patriotic character and peculiar fitness for directing the welfare of the exposition.

The government of the United States, by special act of Congress, has appropriated $130,000 to be spent in the construction of a suitable government building and to defray the expenses of a government exhibit.

Governor Morton, by special authority from the legislature to do so, appointed a commission, to serve without compensation, to represent the State of New York at this exposition. The members of that commission, in their inquiry as to the purpose and scope of the centennial, have ascertained that the people of Tennessee have generously subscribed toward the exposition, and with that support its success is guaranteed.

New York is worthily recognized as the Empire State of the Union; enjoying that great distinction, she cannot afford to be outstripped by any sister State in patriotic endeavor, or in competitive display of natural resources and industrial progress.

For the benefit of exhibitors who may not find it convenient to accompany and give personal attention to their exhibits, especial arrangements have been made by the formation of a company which guarantees to take all such exhibits in charge, and to give them the same watchful superintendence as they would have if their owners were present.

The secretary to the New York Commission has been furnished by the authorities of the exposition with abundant literature explaining the aims, objects, plan and scope of the exposition. He will be glad to furnish this literature on application, or to call in person upon anyone sufficiently interested in the subject to desire fur-
Nashville, Tenn.

On this same line all persons who may be thinking of making an exhibit at the exposition are advised to correspond immediately and directly with the Director-General, Major E. C. Lewis, at Nashville, Tenn.

In conclusion we respectfully urge upon all the people of New York to interest themselves in this useful and patriotic enterprise and to lend it their substantial support.

JOHN C. EAMES, Pres't, New York,
(The H. B. Claflin Co.).

ALGAR M. WHEELER, Secretary.
Gilsey House, New York.

THE SANITARIAN.

APRIL, 1897.

NUMBER 329.

AN IMPROVED METHOD OF FILTRATION.*

By FRANK H. MASON, Consul-General, Frankfort.

There is now in operation at the city of Worms, in this district, as well as at Kiel, Winterthur, Frankenhausen, Landsberg (near Berlin), and several other places in Germany an improved system of filtration for water, which should have an important interest for the numerous municipalities in the United States that are struggling with the problem of purifying river water on a large scale for household and manufacturing purposes.

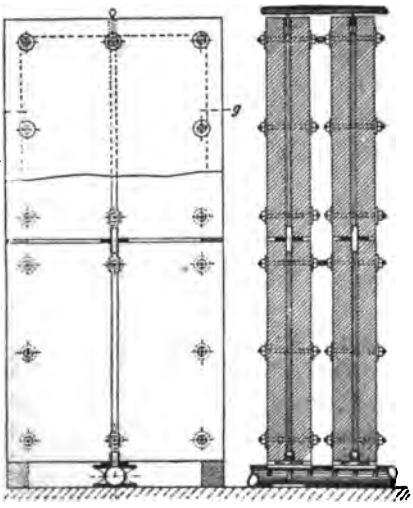
Hitherto, the method most generally employed has been that of filtering through sand or gravel, and, for this purpose, a layer 30 to 40 inches thick of clean sand, mixed in some cases with charcoal, has been used. The sand, being loose and nonadhesive, lies, of course, at the bottom of the tank, and in this form entails two important economic disadvantages—first, the area of space required is large in proportion to the amount of water to be treated, and, second, all sediment in the water settles upon the sand which forms the bottom of the filter, and which soon becomes gorged and clogged so that the filter must be thrown out of use while it can be cleaned by mechanical means.

The new system, which the present report will briefly describe, is the invention of Director Fischer, for many years past waterworks engineer of the city of Worms, where the use of Rhine water for general purposes presented the same problem that confronts cities like Cincinnati, St. Louis, Cairo, and others which derive their water supply from the often turbid rivers of the Mississippi Valley. The germ, or fundamental idea, upon which the new system is based is the fact that clean, sharp sand, when mixed in due

*Report to Department of State.

proportion with finely pulverized glass, which may be derived from the waste of glass works, old bottles, etc., forms a porous mass, which, by baking under a high temperature, may be hardened in any desired form. The inventor in this case hit upon the plan of molding this porous cement into hollow plates or plaques about 40 inches square and 8 inches thick, that is, with walls 3 inches in thickness and about 2 inches of hollow space at the center of the plaque.

In constructing the filtering plant, these plates are set upright in groups or batteries of any number, according to the desired size and capacity of the establishment, and are ranged along the lower portion of one or more tanks of hydraulic masonry, where they can be covered to a depth of 3 or 4 feet with the water to be filtered. The water is then forced by its own pressure through the porous walls of the plate into the interior hollow space, where it trickles down and is drawn off through pipes, laid at the bottom of the tank, to the reservoir which receives the filtered water. These discharge pipes are rigged with cocks so that each plate and group of plates may be isolated for cleaning or other purposes while the adjacent batteries are in operation. For greater economy of space and tubing, two tiers of plates are set, one above another, as shown in the accompanying drawing, which gives a front and edge view of two pairs of plates, set in the usual manner, whereby both tiers are served by one set of discharge pipes. The water, in passing through the 3-inch walls of vitrified sand, is filtered as perfectly as by traversing 3 feet of loose sand or gravel in the ordinary sand-filtering process. The plates, being set upright and close to each other, increase from eight to ten fold the filtering surface that may be condensed within any given superficial area, thus securing an important economy of space within frost-proof constructions, and where, as is often the case, land is costly and difficult to obtain.



Nor is this the only, or even the principal, advantage of the new system. Every practical waterworks engineer knows the delays, labor, and expense

involved by turning sand filters out of circuit and cleansing them of the mud and detritus which collect so rapidly at the bottom of the tank. With the plaque filter, the cleansing operation is easily and quickly performed by simply reversing the current of water, that is, turning it backward through the discharge pipes into the hollow plates, whence it percolates outward through the porous walls into the tank, dislodging readily the dirt that has collected on the outer surface. This falls to the bottom of the tank in which the plates are submerged, and is drawn off in liquid form, assisted, when the accumulation is large, by means of a hoe or shovel, and followed, when the tank has become emptied, by flushing with a jet of water from a hose, which cleans thoroughly the surface of the plates and washes out the bottom of the tank itself. The discharge cocks are then closed and reversed, water turned again into the tank, and the process of filtration resumed.

The depth or "head" of water necessary to make the filtration sufficiently rapid is from 3 to 4 feet, and the reverse head, for cleaning the plates by turning the water backward through the discharge pipes, should be about 6 feet to give sufficient pressure for the best results. Thus constructed, the filtering plant at Worms, which may be taken as the original type and model of the system, has been in constant operation during the past four years, without accident or appreciable deterioration. From all testimony that can be obtained, the results at Worms, both as regards economy of construction and maintenance and speed and thoroughness of filtration effected, have been eminently satisfactory.

The tanks, as already indicated, are made of masonry laid in hydraulic cement, and if galvanized tubing is used, to obviate rusting, the life of such a plant may be indefinitely prolonged. The demonstrated success of the original filtering plant has led to the organized manufacture of the plates by the firm of Bittel & Co., who have large works at Worms-on-Rhine, and furnish not only the prepared materials, but estimates and plans for filtering outfits for municipalities and manufacturing establishments, such as breweries and chemical and other works in which a large supply of limpid water is an essential requisite. Smaller installations are also furnished to works in which river water or spring water, strongly charged with oxides of iron, is used for generating steam.

According to an official report by M. Janssen, of the University of Brussels, who made an exhaustive study of the whole subject at Worms, that city began in 1889 the filtration of Rhine water for

general purposes by the ordinary sand-filtering process, similar to that then used at Berlin. With a filtering surface of 1,300 square meters (approximately 13,000 square feet), 3,000 cubic meters (792,510 gallons) of water were filtered in twenty-four hours. This supply proved insufficient for the city, and it became necessary to construct and addition to the filtering plant, the cost of which, on the sand-filter plan, was estimated at $30,000. It was then that the Fischer system was given a practical trial.

Instead of occupying new land and building additional constructions, one of the ten vaults containing the sand filters already in use was isolated, cleaned out, and the space filled with a battery of five hundred plates of the Fischer pattern. The whole cost of the change thus made was about $9,600, and the new filters, occupying one-ninth as much space as the sand filters, doubled the filtering capacity of the entire installation. In other words, five hundred Fischer plates, costing, set up and ready for operation, $9,600, and occupying only 130 square meters of space, filtered as much water as the sand filters which occupy 1,170 square meters of space and cost $30,000. To substitute the Fischer plates for sand throughout the entire establishment would be to increase the filtering surface from 1,300 to 10,000 square meters (approximately from 13,000 to 100,000 square feet) and multiply by ten the daily filtering capacity of the plant.

From a long series of analyses and careful observations made by the sanitary authorities at Worms, it appears that the efficiency of the two sysems of filtering, which are there worked side by side, are practically identical, so far as regards their effect upon the chemical purity of the water, but the percentage of bacteria left by the Fischer process is somewhat greater than is left by the sand filter when clean and in good working condition. This, however, is not considered a defect of practical importance. The water delivered by the new filters at Worms, as well as at the other places where they are in daily use, is certified by high and impartial authority to be thoroughly purified and fitted for drinking, as well as for culinary and manufacturing purposes.

FRANK H. MASON,
Consul-General.

FRANKFORT, December 9, 1896.

HEALTH DEPARTMENT OF THE GREATER NEW YORK.

By Stephen Smith, M. D.

At a meeting of the section on public health of the New York Academy of Medicine February 7th, to discuss the Greater New York charter in its relation to the Board of Health, Dr. E. G. Janeway presided. Dr. Stephen Smith read the paper of the evening on "The Health Department of Greater New York," as follows:

There are three points of criticism, for the most part, that call for serious consideration. Two of these are general and one specific. The first is the anomaly presented in civil government by the creation of a department clothed with such arbitrary and unrestricted power as the Board of Health will be. As the matter stands at present, the head of that body is invested with judicial, legislative, and legal power, without a higher authority. Not only does he make the laws governing property, but even persons. He employs his own officers and combines within himself all the functions exercised by a full-fledged government.

Such a state of affairs should not be tolerated unless it is absolutely essential to the public welfare, and is defensible only if the actual work can be accomplished in no other way. No precautions are taken to guard against dishonest officials, and this is all the more to be condemned as no department furnishes such opportunities for corruption and bribery as the Health Department.

The second objection to be considered is the fact that no provision is made for the qualifications which the officers of the department should possess, and it is of vital importance that incompetency should be guarded against. If the board is composed according to the system provided for in the charter, it will be unfit to perform its duties. The very fact that two of its members are ex officio is an invitation for the introduction of partisan politics, an element that should have no place in a health department.

The third objection, while specific, is none the less grievous. It is especially provided that of the three Commissioners appointed two shall be physicians and one a layman, and that the layman shall be President of the board. Under no consideration can a physician hold that office. Thus a lawyer, grocer, cobbler, pedlar, or any

tramp, just so he has no medical knowledge, is declared qualified for the position, and the only disqualification is being a physician.

In defense of this the superannuated theory is set up that a physician has no executive or business ability; but experience has proved that this is a fallacy. The President of the National Board of Health was a physician, and the report submitted by him to Congress was declared a model of accuracy and conciseness.

As a remedy for these evils, Dr. Smith suggested that the charter be so amended as to provide for the representation of the three essential requisites, namely, medical science, sanitary engineering, and law, in the Health Department, and to that end he advocated the appointment of three physicians, one lawyer and one sanitary engineer, all of ripe experience and residents of the boroughs of Manhattan, Brooklyn, Bronx and Queens, as Commissioners, with the Health Officer of the Port and the President of the Police Department as ex-officio members of the board, so as to provide a restricting power. The President of the board to be elected by the Commissioners themselves.

With regard to Coroners, he said:

The antiquated method of verifying the causes of sudden death, determining the question of crime and detecting the criminal, is apparently to be perpetuated in the new municipality. Experience has shown that no scheme can well be devised which will so certainly fail of its object as the Coroner's system, from which this State has suffered since Colonial times. So far from determining the exact causes of death, the returns from the Coroner's Office are the most imperfect and unreliable of any that are made. The Coroner's Court has long been an object of ridicule and contempt, and instead of aiding in tracing crime to the criminal, has often been the medium by which both the crime and the criminal have escaped detection.

In many States and notably in Massachusetts this relic of ancient English jurisprudence has long been discarded, and modern scientific methods have been instituted. In this State no reform has been possible until now, owing to the Constitutional provision by which the Coroner was recognized as a public officer. The late Constitutional Convention, however, omitted any reference to the office, and thus the way is now open for the adoption of a reform measure.

If we rightly consider the object to be accomplished it will not be found difficult to formulate a method of procedure which will

give very exact results with the least possible expenditure. Two objects are sought to be accomplished in every case of death which occurs "from criminal violence, or by a casualty, or suddenly when in apparent health, or when unattended by a physician, or in prison, or in any suspicious or unusual manner." 1. The exact cause of death is to be determined, with the contributory causes. If there are no conditions indicating or suggesting that the death was caused by a second party it is recorded and the proceeding ends. 2. If, however, there are undetermined conditions which involve the possibility of crime, the case must come under the jurisdiction of a competent court, when the criminal side is judiciously investigated and determined.

Apparently we have at hand all the necessary machinery for fulfilling these objects in the most exact and perfect manner. For the verification of the cause of death the Health Department has every needful appliance in its laboratories, and the experts in pathology, chemistry, bacteriology and allied sciences necessary for the most exhaustive and scientific investigation of the causes of death. And such exact inquiry into the causes of death is the duty of the Board in its daily work. Why, then, should not the verification of deaths by the Health Department be made the basis of determining whether there was not criminality connected with any death? If this obligation were made statutory the Board of Health could rapidly organize its methods of procedure accordingly.

The judicial determination of the crime and the investigation necessary to fix the responsibility of the crime upon its perpetrator come within the sphere of duties of our inferior courts of criminal jurisdiction. To give practical effect to these suggestions there might be organized in the Bureau of Records a department devoted to the verification of deaths. The head of this service should be a physician, expert in pathology and in autopsical investigations,who might be called the "medical examiner." Under his direction there should be such a number of assistants in each borough as might be necessary, as, for example, five for New York, three for Brooklyn, one for Bronx, one for Queens and one for Richmond. Every death occurring without proper certification of cause should be at once referred to the Board of Records or its branch offices for verification.

The medical examiner and his assistants should have all the power in making the preliminary investigation now conferred upon the Coroner and his deputies. If, on investigation, it is satisfactorily proven that no suspicion of crime attaches to the cause of death,

the case is reported to the Bureau of Records in the regular manner. If, however, there is suspicion of crime, the fact should be reported to a magistrate, who should proceed to hold an inquest. This should consist of the testimony of the medical examiner or his assistant, and that of any other witnesses that may be found necessary. After hearing the testimony the magistrate should draw up and sign a report in which he should certify when, where and by what means the person deceased met his death; his name, if known, and all material circumstances attending his death. If it appear that his death resulted wholly or in part from the unlawful acts of any person, he should further state, if known to him, the name of such person, and of any person whose unlawful acts contributed to such death, and shall return such report to the next criminal court of record that shall be held.

If our system of verifying deaths was thus organized and the procedure in cases of suspicious deaths here outlined were followed, hundreds of cases now brought to an inquest with no other result than a vast amount of low badinage and a heavy expense to the city would never come to public notice, and those where crime has actually been perpetrated would pass through a regular course of medical and judicial inquiry, and reach a just conclusion in a verdict of conviction or acquittal.

Dr. George B. Fowler, Health Commissioner of New York, differed with the preceding speaker on the subject of an extended board, saying that the present system answered all purposes, and it would be unwise to have a physician President of the Board, as it would throw too much routine work and responsibility on his shoulders, and he could not give the medical work of the department sufficient attention.

Dr. Z. Taylor Emery, Health Commissioner of Brooklyn, coincided in the main with Dr. Smith. He said that he could not see how a Board of Health could get along without a Sanitary Engineer. He believed in full scope being accorded it in all administrative matters, but in cases of emergency the Mayor should be consulted, who, in turn, should ask the advice of the President of the New York Academy of Medicine.

Other speakers were Dr. Theodore Walser, Health Officer of New Brighton, S. I.; Dr. J. Walter Wood, Health Officer of Port Richmond, S. I.; Dr. T. J. Thompson, Health Officer of Clifton, S. I., and Dr. E. H. Grandin.

HYGIENIC DEMANDS FOR SCHOOL BUILDINGS.*

By A. M. SLOAN, ESQ., President of the Greensburg Board of Health, upon the Advisability of Regulating the Erection of School Buildings by Act of Assembly.

Pennsylvania is justly proud of her schools. Not a village or hamlet in all the State but can boast of some sort of school house. It is a matter of just pride that the humblest child may pass, step by step, from the very rudiments of knowledge to the acquisition of the arts and sciences. Pennsylvania has done nobly for the education of her children, yet amidst this rejoicing we must not forget the defects of this system of common schools and the perils which threaten it. I am not disposed to be a chronic fault-finder—nor often look on the dark side of things—but I fully believe there are breakers ahead of our educational ship, and as a faithful pilot I sound the warning of the dangers inside our beautiful intellectual structure. A perfect educational system should fit the youth of the State for the active duties and responsibilities of after life. If this public school system of ours does not accomplish this, then it is, to a greater or less extent, a failure. To turn out of our schools on graduation day an intellectual giant with a diseased body, and call such a man or woman, is a misnomer; to claim such a combination an educational success is an absurdity. If there be anything in our school management that tends to produce diseases of the body, our first duty should be its extirpation. "A sound mind cannot exist in an unsound body" is a very old adage.

Rousseau says if you wish to develop the mind, develop the power which the mind has to govern. Make him strong and healthy, that you may make him prudent and reasonable.

Milton declares that to be weak is to be miserable.

Watson says that intellect in a weak body is like gold in a spent swimmer's pocket. The richer he would he under other circumstances, the greater his danger now. Of all teachers nature is the most severe, since she never forgets an infraction of her laws, and visits her penalties alike upon the ignorant and guilty.

*Read at the meeting of the State Health Authorities at Harrisburg, January 25, 1897.

What has the great State of Pennsylvania done to guard the health of her children? Nothing. Most of the school buildings of the State have been defectively constructed and are a fruitful source for the propagation of contagious and preventable diseases. It is stated, on what seems competent authority, that 200,000 persons are annually slaughtered in the United States by preventable diseases. How many of this number are school children cannot be stated with any degree of accuracy, but it must be large.

We embellish and decorate the exterior of our educational buildings, but apply no scientific principles in the adjustment of light, heat and ventilation, and as a result have a legion suffering with optical and other diseases due to improper illumination or ventilation. Three and four story buildings are erected for school purposes, and our girls go up and down long stairways, engendering physical ailments which incapacitate them for life and render the succeeding generation at least weaker if wiser.

The spinal and other diseases caused by this excessive climbing to thousands of girls cling to them through life, producing an untold amount of suffering, supplanting youthful beauty with wrinkled and pale features, and prematurely bringing on decay and old age. Shall we allow this to continue year after year and be silent?

Physicians occasionally, through the medium of some medical journal, herald a blast against these radical evils, yet, because of the means employed their influence fails to reach and arouse the people. The bad effects arising from bad light, heat and ventilation are so many, so varied and so far-reaching that I conceive it to be the duty of this association to so speak and act that legislative relief may be had, so that our schools may be relieved of the danger which threatens, with other causes, to deteriorate the race. We should know that our children take their bodies to school—lungs, intestines, blood, backbone, nervous system; that the schools, as they exist, proceed for the most part on wilful ignorance of the conditions which these and other organs demand for health, and that as a matter of demonstrated fact the school is seriously attacking the physical vitality of the race.

Were you ever in one of our primary schools, crowded with pupils, on a cold winter day? Of all places needing ventilation, none seem to demand more; crowded with children of an age at which they pay but little if any attention to personal cleanliness—the material is of the best to render the air impure and unfit to breathe. The young and growing body is profoundly influenced for good

or evil by hygienic surroundings. Bad sanitary conditions may so impress the delicate organization of a naturally weak child as to make life a burden to him, or may so influence a vigorous constitution as to materially lessen his power.

The foolish method of training the mind at the expense of the body can only be denounced as criminal, and it behooves us to take a hand in the matter, and force sanitary legislation for the welfare of the children of the Commonwealth.

SHORT-SIGHTEDNESS.

Some one has said, "Schools are absolute manufactories of the short-sighted;" a variety of the human race which has been created within historic time, and which, if the result of the investigations is to be believed, is enormously increasing in number this last half of the nineteenth century. As generation follows generation visible defects multiply. Excessive eye strain in extreme cases of myopia causes blindness.

It is true that short-sightedness is often hereditary. But, I take it, this does not mean that the children of short-sighted parents are born short-sighted. They have only the predisposition to become so, and this predisposition is developed through school life. Yet the conditions surrounding the children in most of our schools tend to produce short-sightedness in children who have no hereditary predisposition, and the statistics, in so far as I am able to gather them, show that the percentage of school children afflicted therewith increases from year to year. The effects of school life in producing near-sightedness in the pupils was first brought to my attention by reading some time ago of the result of the systematic study of the subject by Dr. C. R. Agnew, of New York. In an address before the Medico-Legal Society of that city, he stated the results of an investigation made in various schools of Cincinnati, New York and Brooklyn. The number of pupils examined was 1,479, of whom 630 were in Cincinnati, 549 in New York and 300 in Brooklyn. Of the 630 pupils in the Cincinnati schools, 209 were from the primary grades, and of these 83½ per cent. were near-sighted. In the intermediate schools, 210 pupils were examined, and of these 80 per cent. were natural and 14 per cent. near-sighted. In the high school, the eyes of 210 students were examined, and of these 78 per cent. had normal vision and 16 per cent. near-sighted.

The 549 students examined in New York belonged to New York College. Here, in the preparatory classes, 57½ per cent. were

found with normal vision, and 29 per cent. near-sighted. In the freshman class 42½ per cent. had natural eyes, and 40 per cent. were near-sighted.

In the sophomore class, no very material difference was observed from that in the freshman class.

But in the junior class, 37 per cent. had natural eyes, and 56 per cent. were near-sighted.

The Brooklyn students examined belonged to the Polytechnic Institute of that city. Here, in the Academic Department, 56 per cent. had normal vision, and 10 per cent. were near-sighted. In the next higher grade 53 per cent. were emmetropic, and 28½ per cent. near-sighted.

The statistics of Dr. Cohn, of Breslau, prove how frequently myopia is produced. He found in the first degree schools in Germany the proportion of myopia scholars was 6 7-10 per cent.

In the second grade, 10 3-10 per cent.

In the third grade, 19 7-10 per cent.

In the highest grade, 26 2-10 per cent.

The alarming rapidity with which myopia is increasing among German students formed the subject of a recent debate in the Prussian Parliament. It was there stated that the number of short-sighted increased from 23 per cent. in the first year to 75 per cent. in the ninth or last year. It seemed to be the consensus of opinion in that discussion that ill-ventilated rooms and insufficient light were the main causes of this widespread evil.

Dr. Risley, of Philadelphia, has determined that the increase of near-sightedness in the public schools of that city is from 1 4-10 per cent. in the primary grades to 28 9-10 per cent. in the grammar grades.

An investigation made in Baltimore by direction of the Board of Education a few months ago discloses the fact that in the public schools of that city thousands of children are suffering from defective vision. The extent of the danger may be understood from the fact that out of 53,000 children thus examined, the eyes of 9,051 were found to be seriously impaired.

The examination of the children of some of the schools of Cleveland by Dr. West and Dr. Newman, in the number of pupils.

Cleveland—Hornersville, N. Y., Pennsylvania, Champaign, Decatur, Mass.

In December last the sight of the school children of Utica, N. Y., was tested with the following results:

Whole number of pupils examined..... 6,118
Number of pupils found with defective vision..... 2,167
Or 35 6-10 per cent.

I have also lately received the report of a like test made in the schools of Sioux Falls, S. D., which shows 47 per cent. of pupils with defective vision. If such a condition of things exists in some cities no doubt it may be found in others, and the danger of myopia is of so grave a character, unless checked in its progress, it will certainly become a national affliction, as is the case in Germany.

A series of questions touching the care of the eyes were recently submitted to Dr. E. G. Loring, Jr., by the Medico-Legal Society, of New York. Dr. Loring replied in a paper, which has since been published in the "Medical Record." To the first question—namely, Whether bad air has any direct effect on the sight?—the author replies that vitiated air has a specially irritating influence on the mucous membrane of the eye, and that bad air, as a primal cause, may set in train morbid processes which not only will affect the working capacity and integrity of the organ, but may even lead to its total destruction.

The great increase in the impairment of the vision from the entry of school life until the close would indicate the great work that remains for us to do to remedy and remove the causes as far as we can. To thus destroy the most useful of senses in helpless school children seems to be a steady march from savagery to barbarism.

Again, its increase, from a national point of view, is to be considered a serious evil.

In former times, when literary education was confined to a small number, the question was of little or no importance; now that education is universal, and the safety of the republic depends upon its enjoyment, the question how to prevent it deserves the most serious consideration.

CONSUMPTION.

Keating in his work, "Diseases of Children," says that bad air is notoriously influential in causing consumption; that the impure condition of the air in public buildings has very much to do with the great prevalence of such diseases as phthisis, pulmonatis, bronchitis and pneumonia, which, together, make up one-fourth of the total mortality, and that there is little exaggeration in the statement that all diseases are caused or made more severe by it.

The apparent effects of breathing a foul atmosphere are more noticeable in a badly ventilated schoolroom than anywhere else.

Some of the effects are exhaustion, temples throbbing, head hot, feet cold, face flushed; some are sleepy and dull, while others are restless and drowsy.

Morrison, in his book, "The Ventilation and Warming of School Buildings," says: "The invariable verdict of all investigators of public school ventilation may be epitomized as *bad*, BAD, BAD. Some are better than others, or, rather, some are not so bad as others, but the difference is rather in degree than in kind."

Dr. Edson says that prior to March, 1894, not a single one of the public school buildings of the great metropolitan city of New York had a complete ventilating equipment. We have the great papers of that city as authority for the statement, that in many instances more than double the number of children that should have been admitted were crowded into badly lighted and poorly ventilated rooms.

So far as respiration is concerned, man is a poisonous animal. It is said that we poison each other in health more than in disease; that man's own breath is his greatest enemy, and that air once breathed is unfitted to sustain life. The boys and girls which are to become our future men and women are forced to sit by the hour in rooms where every particle of air is foul with many breaths, and the result is enervated, undeveloped bodies, in many instances too feeble to be anything save a clog to the spirits which inhabit them.

To quote Keating again: "If the blood, which is the life of the flesh, be poisoned by impure air, the nerve centres are cheated of their nutriment and also poisoned; hence the ideas become confused, the emotions morbid and the will weakened. The whole being is crippled mentally, morally and physically." It is, therefore a fact beyond dispute that bad air exerts a highly dangerous and immoral influence. And when we think that this dangerous and immoral influence is exerted not for one hour, but for six hours a day, five days in the week and nine months of the year, what a tremendous force for evil. Better let them grow up in idyllic ignorance.

It seems idle to take further time to discuss the importance of the subject before this intelligent body. Yet the entire lack of all pretence of securing ventilation of any sort is the rule and not the exception throughout the State. Our State Superintendent of Public Instruction has declared. "There are within the State many buildings used for school purposes into which no law should require a well-mannered youth to enter, but rather compel him, if passing by, to look the other way."

From the foregoing statistics and authorities are deduced the following propositions:

First.—That the percentage of near-sightedness in children, when they enter school, is less than 7 per cent.

Second.—That the number afflicted therewith and the intensity thereof gradually but surely increases through the entire school life, from year to year, until colleges and universities are reached, and in many institutions nearly half the students thereof are more or less near-sighted.

Therefore, in my opinion, the only remedy for the evils now existing in our public school buildings is by legislation, and not by education, because,

First.—School Boards are continually changing; the Board that builds one schoolhouse rarely ever builds the second, therefore there is no opportunity of educating School Boards by experience.

Second.—School Boards are not, as a rule, competent judges of sanitary science.

Third.—County superintendents of schools seem to be indifferent in the matter, and, as a rule, have no knowledge on the subject.

Fourth.—Architects, as a rule, are ignorant of the laws of health.

INCOMPETENCE OF SCHOOL BOARDS.

To prove the proposition that school boards are not competent judges in the matter, the buildings erected by them furnish sufficient testimony to prove the fact.

That County Superintendents are indifferent, or have no knowledge on the subject, is fully attested by their reports to the State Superintendent. I have examined the reports for one year, and in only one instance do I find reference to heat, light or ventilation. I will quote him:

"One hundred and thirty schoolrooms are well ventilated—that is, the windows of this number of schoolrooms can be lowered from the top, while the remaining forty lack this arrangement."

That the fourth proposition is true we have only to examine their work to find they build for architectural beauty; other features are not considered.

A friend of mine tells me he was present in a neighboring city where an architect presented a plan for a new schoolhouse. He had a fine elevation and it was a very pretty picture on paper. He was asked where the fresh air was admitted to the rooms? He replied, "Through this flue," pointing to it on the plan.

"Where does it go then?" was asked.

"The children consume it," he replied.

"Well, what becomes of it afterwards?" persisted the questioner.

"Gentlemen," said the architect, "I am no chemist. I get the fresh air into the children and they must take care of it afterwards."

No wonder that the National Convention of School Superintendents, held in Richmond, Va., some three or four years ago, unanimously passed the following resolution:

Resolved, That each State should, by law, provide for the proper ventilation, lighting and heating of each school, and that there should be at least 1,500 cubic feet of fresh air provided for each pupil per hour. And why should not the State do so? The fish in our rivers, the game in our forests, the minors of the State are of sufficient importance to command the protection and the consideration of our Legislature.

In 1891 our Legislature enacted that the owner, operator or superintendent of every coal mine in the State shall provide and maintain an adequate supply of pure air for the same, and the minimum quantity thus produced shall not be less than 200 cubic feet per minute for each and every person employed therein.

Therefore, no mine owner in the State has the right to place a man in his coal bank and subject him to the poisonous atmosphere therein. Mines are private enterprises.

Schools are public institutions; children of certain age are compelled to attend. Then, most certainly the welfare of more than 1,000,000 of children, affecting, as it must, not only the present, but reaching out into the future, deserves and demands the best thought and highest wisdom of an enlightened Commonwealth.

SOME GENERAL RULES.

Conceding that the State should, by law, provide for the proper construction thereof, I think it will be conceded that this supervision should consist of a few general rules, and therefore should cover the following propositions:

First.—At least fifteen square feet of floor space and 2,000 cubic feet of air per hour shall be provided for each pupil. This air should be delivered into the room near the ceiling, allowing the air to diffuse itself on the top of the room, and there settle down, thus coming in contact with the heads of the pupils first, and in a pure state, without being contaminated by their clothing or the dust from their desks or the floor of the room. This amount of air (2,000 cubic feet to each pupil) is just the amount that the lungs require to

keep the pupil in a healthy condition and is fully as important to him as is nourishment and suitable food.

Second.—The heating apparatus sufficient to warm this amount of air must be placed in the basement, and it must be of sufficient capacity to heat the required amount of air to the desired temperature to warm the room to 70 degrees in the coldest weather, and at no time, nor under any circumstances, should the air be subjected to a red-hot surface. This is to say, competition sometimes is so sharp as in many cases to induce cheap rather than good construction. Small furnaces have been used, in which the temperature of the exterior shall have to be kept so high, in order to meet the demands for heat, that two evils result—deleterious gases will pass through red-hot iron, where they will not through iron that is not heated to the point of redness, and red-hot iron burns up part of the oxygen in the air and makes it unfit to breathe.

Third.—That the light should enter the room so that it shall come from the left of the pupil, and it should never be less than one-seventh of the floor space. The windows should be so constructed that there will be little or no shadow.

Fourth.—The size of the halls and stairs should be regulated. There should be one entry for each 100 pupils. These entrances should be vestibuled, and all steps leading to the hall should not be less than six inches wide, and all stairs made fireproof. The hall space should be equal to one-sixth of the room space. Foot warmers should be placed in each hall so that the children may dry their feet in wet weather.

Fifth.—The cloakrooms should be heated and air changed therein at least four times an hour.

Sixth.—The thickness of the walls should be regulated in order that the building may possess the requisite strength. No doubt oftentimes in cutting down the estimates in order to erect a large building with the means at hand the walls are weakened and the building rendered unsafe.

REQUIREMENTS.

In the ventilation and heating of buildings the following requirements shall be complied with:

First.—That the apparatus will, with proper management, heat all the rooms, including corridors, halls and cloakrooms, to 70 degrees F. in any weather.

Second.—That with the rooms at 70 degrees and a difference of not less than 40 degrees between the temperature of the outside air

and that of the air entering the room at the warm air inlet, the apparatus will supply at least 30 cubic feet of air per minute for each scholar accommodated in the rooms.

Third.—That supply of air will so circulate in the rooms that no uncomfortable draft will be felt, and that the difference in temperature between any two points on the breathing plane in the occupied portion of a room will not exceed 3 degrees.

Fourth.—That vitiated air, in amount equal to the supply from the inlets, will be removed through the ventiducts.

Fifth.—That the sanitary appliances will be so ventilated that no odors therefrom will be perceived in any portion of the building.

All buildings, more than one story in height, shall be constructed of brick or stone. There shall be at least two flights of stairs at a distance from each other, so that both shall be accessible from every room in the building.

No building shall be erected to a greater height than two stories, exclusive of the basement. Where brick or stone is used in the construction of buildings having more than one story all carrying walls below the first story shall be at least twenty inches in thickness; that the carrying walls of the first story above the basement shall be at least sixteen inches in thickness.

The basement shall be at least one-half to three-fifths of its height above the ground, so that it may be well lighted and airy.

No smoke pipes shall be placed nearer than four inches to any woodwork.

No wooden flue or air duct is to be used for heating or ventilating purposes.

The soffits of all stairs should be plastered on metallic lathing. All long flights of stairs to have two smoke-stops in each. These smoke and fire stops to be constructed by cutting in false risers and nailing §-inch perpendicular strips on the back side of these risers, and lathed with wire lath properly fastened to the wire lathing on the under side of stairs, plastered on both sides and left smoke-tight.

For the purpose of carrying out the provisions of the act four State Inspectors shall be appointed, one of whom shall be Chief, and one each for the Western, Eastern and Middle Districts.

The suggestions of the paper were endorsed by the association and referred to the Committee on Legislation, with the request that a bill to the end desired be prepared and presented to the Legislature at the present session.

TOPOGRAPHY, CLIMATE AND MINERAL SPRINGS OF LOUISIANA.

By A. N. Bell, A.M., M.D.

Louisiana is situated wholly within the Mississippi Vallev, and the greater part is comprised in the delta of the Mississippi River. It lies between the meridians of 89° and 94° W. lon. from Greenwich, and between the parallels of 28° 56' and 33° N. lat. The extreme length of the State from east to west is 298 miles, and its extreme breadth from north to south, is about 280 miles. The total area is about 41,346 square miles. Its form is very irregular, although a part of its boundaries are parellels and meridians. On the north its boundary is along the 33d parallel, which divides it from Arkansas, as far east as the Mississippi River, and from the mouth of the Red River to the Pearl River to the 31st parallel, which divides it from Mississippi; on the east the Mississippi River separates it from Mississippi as far as the mouth of the Red River, and the Pearl River from the 31st parallel to Lake Boyne forms the boundary between it and the same State; on the south and southeast the Gulf of Mexico and several sounds and estuaries from the Gulf form its boundary; on the west the Sabine River and Lake separate it from Texas to the point where that river crosses the 32d parallel, and thence northward of the 33d parallel the boundary runs along the 94th meridian.

The face of the country is for the most part low lying and approximately level. The north and northwest portions are somewhat rolling, with hills but rarely rising 200 feet, and none exceeding 250 feet in height; and from these the land slopes gradually toward the Mississippi River and the Gulf.

A large portion of the delta of the Mississippi, and especially that portion below New Orleans, is marshy, and actually below the river at high water. In all, about 8,450 square miles, or one-fifth of the area of the State, is subject to inundations, though not all of it annually. Along the Mississippi River much of the land is below the surface of the river during the spring freshets, and is protected from overflow by the levees, or artificial embankments. These levees extend 120 miles above New Orleans and about 3 miles below. They are sometimes worn and broken through by the

floods, and the "crevasses" thus produced subject thousands of acres to submergence. Local topographers classify the lands of the State as "good uplands;" "pine hill lands," usually not very fertile; "alluvial tracts;" Bluff of Loess regions;" "marsh lands:" "the prairie regions;" and the "pine flats."

The whole alluvial region of the delta is very fertile, and its deep black loam yields enormous crops. The hilly country, on the contrary, is not very productive, and some portions are sandy barrens.

Of the Rivers, Lakes, Sounds and Bays, the Mississippi River is pre-eminent. It has a course of about 500 miles in the State, and is navigable for the largest steamers throughout. Red River, the second in size of the great tributaries of the Mississippi, enters the State in the northwest and crosses it diagonally to the 31st parallel, where it enters the Mississippi. Its principal affluents in the State are Washita, with its two large branches, the Tensas and the Boeuf, the Dugdemona, the Sabine Bayou, and the Bistineau River and Lake. The Sabine River forms a part of the western boundary of the State, and the Calcasieu and Mermenteau are considerable streams, the latter having several tributary bayous or sluggish streams.

The Pearl River, having Bogue Chitto for a tributary, the Tangipahoa, Tickfaw, and Amite are the principal streams east of the Mississippi. There are besides these several large bayous or estuaries, which are really outlets or secondary mouths of the Mississippi, which in flood-time convey a large portion of its waters to the Gulf, and at other times drain the greater part of the southern portion of the State. The principal of these are Atchafalaya Bayou, with its series of lakes, Vermilion Bayou, Bayou Teche which connects with it, Bayou de Large, Bayou la Fourche, and the estuaries, lakes and bayous which debouch into Barataria Bay. The distinction between lakes, sounds and estuaries in this State is not very marked. Lake Pontchartrain is perhaps a lake in the sense of being surrounded by land, except at its outlets, but its waters are salt, and rise and fall with the tide. Lake Borgue is only a sound or bay; Lake Mauretas is closely connected with Ponchartrain; Sabine Lake, Calcasieu Lake, Lake Mermenteau, Grand Lake, Marsh Lake, Lake Charles, Grand Cheniere, Caillou, Lake Washa, etc., are all estuaries connected with rivers or bayous.

In northern Louisiana there are ten or twelve lakes which are expansions either of the Red River or its tributaries. Some of these are of considerable extent. Along the coast there are: Chan-

deleur and Isle au Breton Sounds, Bay Ronde, Garden Island Bay, East and West Bays, Timbalier, Terre Bonne, Caillou, Atchafalaya, Cote Blanche, and Vermilion Bays.

The climate of southeastern Louisiana is to a considerable extent malarious, and as the writer has before taken occasion to say,* is, in common with southern Georgia, Alabama, Mississippi and Southern Texas, for about two-thirds of the year hot; and along the coast and river valleys unhealthful. Endemic malarial fevers here prevail more or less annually, and sometimes—in neglected localities—with great severity. It is in such seaports of this coast as have been heretofore—and in some even now—neglectful of sanitary measures, that yellow fever is always wont to make ports of entry.

But the northern and western sections of the State are in general healthful and much visited in winter by consumptives who are commonly benefitted by a residence there. Moreover, New Orleans, by reason of the energetic sanitary measures practiced there during recent years, has become much more healthful than it used to be, and with the accomplishment of the far too-long delayed drainage and sewerage which have been recently undertaken, it is likely to become one of the most healthful as it is otherwise already one of the most enjoyable winter resorts in the country. It comprehends many places and conditions of abiding interest. Many of the old relics of Spanish rule still exist. Its French quarter and old market are unique as objects of interest. There are numerous and well-kept public parks and squares. Lake Pontchartrain and its shores—beginning with old Spanish Fort, but five miles by electric-motor cars from the centre—and primitively contemplated site—of the city, are attractive resorts for amusement, fishing and hunting all the year round. Of other interesting places in the suburbs, the battle field of the famous victory of General Jackson over the British, January 8, 1815, lies but four and a half miles distant from the city, and may be reached by carriage along the levee, or by surface cars. An unfinished marble monument occupying a suitable site overlooking the grounds serves to commemorate the victory. Carolton, Gretna and Algiers are other interesting places accessible by good carriage roads, with fine gardens and handsome residences roundabout.

For places of amusement, New Orleans has long been famous, insomuch that there is no need to particularize in this connection.

* Climatology and Mineral Waters of the United States. By A. N. Bell, 1885, p. 193.

But besides the regular sources of amusement which it enjoys in common with other cities, New Orleans is noted for its great displays during the holiday and carnival season. Among the many societies which contribute to these displays, the most famous are the Twelfth-Night Revellers, who appear on the night of January 6th, and the Mystick Krewe of Comus, who appear on the night of "Mardi Gras," or Shrove Tuesday. On the same day (Shrove Tuesday), Rex, King of the Carnival, arrives with a large retinue, takes formal possession of the city for the nonce, and makes a grand display, followed by his staff, courtiers, and attendants, all mounted and dressed in the most gorgeous Oriental costumes. The processions are followed by receptions, tableaux, and balls, which are largely attended by the *elite* of the city and by strangers sojourning there, who in some mysterious manner are always the recipients of unique cards of invitation.

Of chuches there are many—the most famous being the old Cathedral of St. Louis (Roman Catholic), on the east side of Jackson Square. It has an imposing facade surmounted by a lofty steeple and flanked by two towers, each surmounted by a smaller steeple. The foundation was laid in 1792, and the building completed in 1794 by Don Andre Almonaster, perpetual *regidor* of the province. It was altered and enlarged in 1850, from designs by De Louilly. The paintings on the roof of the building are by Canova and Rossi. The Church of the Immaculate Conception (Jesuit), is also a striking edifice in the Moorish style of architecture. St. Patrick's (Roman Catholic) is a fine Gothic structure. Its tower, 190 feet high, was modeled after that of the famous minster at York, England. The Chapelle St. Roche, an old structure in the French quarter, is notable as the resort of young ladies who, it is said, offer prayers there on certain occasions for speedily gaining husbands. The old Ursaline Convent, erected in 1787, during the reign of Charles III., by Don Andre Almonaster, is an interesting relic of early church history in the city. It is now known as the Bishop's Palace, and is occupied by the bishop. The most fashionable of the Episcopal churches are Trinity and St. Paul's. The latter is a handsome specimen of the gothic style and has a rich interior. The oldest of the Episcopal churches, dating back to 1806, is Christ's Church. The First Presbyterian is a fine structure in the Greco-Doric style, much admired for its elegant steeple, which is the highest in the city. The McGhee Church is noted for its prominence in the distinction of the "Methodist Episcopal

Church South." The Temple Sinai, Jewish synagogue, is one of the handsomest places of worship in the city—built of particolored bricks, with a portico flanked by two towers capped with tinted cupolas. The Unitarian Church is also a handsome structure.

The cemeteries of New Orleans are remarkable and always attract the attention of visitors for their peculiar modes of interment above ground. From the nature of the soil, which is waterlogged at a depth of two or three feet below the surface, all the graves or tombs are above ground. Some of these are very costly and beautiful structures, of marble, iron, etc.; but the great majority consist of cells, placed one above another, generally to the height of seven or eight feet. Each cell is only large enough to receive the coffin, and is hermetically bricked up at its narrow entrance as soon as the funeral rites are over. In most instances a marble tablet, appropriately inscribed, is placed over the brickwork by which the vault (or "oven," as it is called here) is closed. There are over thirty cemeteries in and near the city; of these the Cypress Grove and Greenwood, on the Metairie Ridge, at the north end of Canal Street, are best worth visiting. St. Louis Cemetery No. 1, at the corner of Basin and St. Louis Streets, contains some fine monuments, of which the more noteworthy are the vaults of the "Societe Francaise de Bienfaisance," "Orleans Battalion of Artillery," and "Italian Benevolent Society." The last is of white marble, and is one of the most beautiful structures of its kind in the country.

The climate of New Orleans in particular differs considerably in its relation to the State otherwise, and from that of corresponding latitude on other parts of the Atlantic coast. The variations are greater and the winters colder. The mean temperature of the coldest month (January)is 45°, but the mercury often falls, for short periods, below the freezing point, and variations of twelve to fifteen degrees in a day are not uncommon. The mean temperature of the hottest month (August) is 82° 40'. The annual mean is about 67°.

The rainfall is exceptionally heavy, amounting to an annual average of 72.81 inches, and the low-lying surface, below that of the river, greatly adds to its inconvenience—a constantly waterlogged soil and an exceptionally damp atmosphere. Hence, New Orleans is not commendable as a residence, or as a resort—except for very short periods—to persons affected with or predisposed to pulmonary diseases, rheumatism, or miasmatic fevers, so long as it remains undrained and unsewered.

Of MINERAL SPRINGS Louisiana appears to be singularly deficient—at least, to their discovery. Four only were reported by the Committee (of which the writer was a member) to the American Medical Association, 1880:

Belle Cheney Springs and Sulphur Spring, in Calcasieu Parish.

Desota Spring, in Desota Parish.

Sulphur Spring, near Covington, Saint Tammany Parish.

Of which no analysis or characteristic description was obtainable.

Walton* mentions the DeSoto Springs, and says that within a radius of thirty miles of its situation (Mansfield), there are several valuable sulphur and chalybeate waters, some of which are popular resorts, provided with cabin accommodations. At Mansfield there are good hotel accommodations.

Besides these, Peale (Bulletin U. S. Geological Survey, 1886), reports:

Chalybeate Springs:

Abita Spring, near Covington, Saint Tammany County.

Claiborne Spring, Claiborne Cottage, near Covington, Saint Tammany Parish.

Denham's Springs, Hill's Springs, Livingston Parish.

Welch Springs, one mile from White Sulphur Springs, Catahoula Parish.

White Sulphur Springs and *Castor Sulphur Springs*, Catahoula Parish.

Uncharacterized:

Abita Spring, near Covington, Saint Tammany County.

Horseshoe Springs, Ibid.

Labatt's Springs, Ibid.

Samaritan Springs, Ibid.

Long's Springs, near Minden, Webster Parish.

Springs, 30 miles south of Castor Sulphur Springs, Catahoula Parish.

Abita, Claiborne, DeSoto and White Sulphur Springs are resorted to to some extent, but in default of analysis of the waters and improvement of the localities they are devoid of a commendable basis.

* Mineral Springs of the United States and Canada, 1883, p. 200.

THE WEATHER BUREAU IN ITS RELATION TO MEDICAL CLIMATOLOGY.

ALBUQUERQUE, NEW MEXICO, January 20, 1897.

To Editor SANITARIAN, Brooklyn, N. Y.:

From time to time articles have appeared in the medical press, pointing out the limitations of our knowledge of climatology and the insufficiency of data, as regards both climatic features and clinical observation, upon which to found a really scientific climato-therapy. In an article, for example, by Dr. James B. Walker, President of the American Climatological Association, in American Journal of Medical Sciences, January, 1897, these points are dwelt upon, and a comparison is made of the thorough study of these matters in Europe, with the somewhat rudimentary knowledge of medical climatology that has been reached in this country. It is to be regretted that this is true; but it is well to know that the means are at hand by which this state of affairs may be greatly improved.

At the basis of all scientific climato-therapy must lie an accurate knowledge of climatology; with this alone can we correlate our clinical observations with the hope of evolving therefrom scientific treatment of disease by means of climate.

It is the belief of the Bernalillo County Medical Society that, in the admirable methods and appliances of the Weather Bureau, we have already provided the means for a well-nigh perfect determination of every climatic feature. Not only is this true, but, from the fact that observers at all first-class stations have the same training, the same methods and the same apparatus, and that the element of "personal equation" is eliminated by frequent changes of observers, we are induced to believe that no foreign country is better equipped for the study of its climate. For these reasons, it is obvious that the meteorological records of each Western Station are strictly comparable with those of every other station, which cannot be the case where independent and diverse methods of observation are in use at various places; and this feature of our Weather Bureau is one of vital importance to successful results.

The following resolutions speak for themselves; but their object can be fully appreciated only by those who have made a study of the Statistical Tables in the Report therein referred to; and it is earnestly hoped that those who receive these resolutions may ob-

tain from the Weather Bureau copies of Vol. 1, Signal Service Report, 1885.

Resolutions adopted by the Medical Society of Bernalillo County, New Mexico, at the meeting held January 15th, 1897 :

Whereas, This Society is impressed with a sense of the supreme value of the methods and work of the Weather Bureau of the United States, in their relation to the science of Medical Climatology, as illustrated in the series of statistical tables published in Volume I, Annual Report for 1885, of the signal service (now Weather Bureau); said tables embracing all the data bearing upon nearly every meteorological feature necessary to a complete determination of the climate of many points scattered over the whole of the United States, so far as these data had accumulated up to the date of that Report, and

Whereas, The value of these tables would be greatly enhanced by working into them the data accumulated in the course of the eleven years which have elapsed since 1885, and a volume of immense value to the medical profession might be produced by appending to these tables, brought up to date, some account of the topography, geological formation, natural drainage, nature and source of water supply, vicinity of mineral springs, etc., etc., at each station where observations are taken; therefore

Resolved, By the Medical Society of Bernalillo County, New Mexico, that the Chief of the Weather Bureau of the United States be respectfully requested to take ths matter into consideration; that the American Climatological Association be requested to cooperate with the Weather Bureau through a committee appointed for that purpose, if mutually agreeable; that copies of these resolutions be transmitted to the Chief of the Weather Bureau, to the Surgeons-General of the Army, Navy, and Marine Hospital Service, respectively, to at least three of the principal medical journals of the United States, to the American Public Health Association and the American Medical Association, and to every State Medical Association in the United States, and their co-operation invited.

It is evident that, the object of the resolutions being the adaptation of the accumulated data to the needs of the medical profession, such an end can best be reached through the joint action of a committee of medical men and the Chief of the Weather Bureau; and it would seem appropriate that such a committee be composed of members of the American Climatological Association.

To such a committee it may be apparent that certain tables might

be omitted or modified, and that others might with great advantage be constructed from those to be made on the lines of the existing tables. It would be a valuable feature of the new volume if it should contain also, under the head of each station, a statistical table of the mean of all observations for the whole term of existence of each station—in other words, its local climate as deducted from all data available.

Moreover, it is evident that more first-class stations are needed in order to obtain a complete knowledge of the climatology of the United States; and that special attention should be given to the study of those regions whose climatic features promise most as therapeutic agents in the treatment of disease. It is obvious, too, that the value of the proposed volume would be materially enhanced by the incorporation of data regarding the geological formations, topography, natural drainage, water supply, mineral springs, etc., etc., all of which are matters of importance to be known concerning any point to which an invalid might be sent.

Finally, the volume thus made up, should be supplied at a minimum cost to the physicians of the United States, enabling them to properly estimate the value of each special region as a therapeutic agent. The work should be revised and brought up to date every five or ten years, so that the effect, if any, of agencies supposed to be at work to modify the climatic conditions in various localities, may be known and guarded against, and more especially, because the data for determination of climate become more reliable as the periods of observation become more extended.

To Sum Up: The object we have in view is to place within reach of the profession a work on the climatology of the United States, which will be a powerful aid to the attainment of a rational climatotherapy; this to be based on the uniform and admirable data of the Weather Bureau, which data are nearly valueless until properly worked up and tabulated. The last compilation was made in 1885, when both the number of stations and the data were generally insufficient, but even then of great value; if it were repeated now, the accumulated data and the new stations would render it still more valuable. If more stations are established and the work brought up to date from time to time, we may ultimately attain a complete climatic record of the various portions of this country; if in addition to the tables proposed, notes concerning topography, soil, water-supply, etc., should be added, the volume would be an invaluable hand-book for the physician.

Your assistance and influence in this matter is respectfully requested.

J. S. Easterday,
Secretary Bernalillo County Medical Society.

DOUBTFUL EFFECTS OF ALTITUDE FOR CONSUMPTIVES.

In the March number of the SANITARIAN is a very interesting paper by George S. Gove, M. D., Whitefield, N. H., on "Altitude—Its Effects Upon Different Individuals, With Report of Two Cases." As these cases possess points of pathological and therapeutic interest to which I have given some attention and upon which I have decided views, I offer to the readers of the SANITARIAN a few comments.

The first was the case of a lady who "had passed through a severe illness which was diagnosed by her family physician as pneumonia." This was followed by "a troublesome cough and dyspnoea." The acute symptoms having abated, the lung was left in a condition of chronic inflammation which caused the cough, and of hepatization which prevented free respiration, and caused the dyspnoea. This was the condition of the lady when she was advised by her physician to leave the comforts of home "to spend the winter months in California," to reach which State she had to undergo a most fatiguing journey. Had the cure of the attack of pneumonia been complete she would not have been left with "a troublesome cough and dyspnoea." She would have been well.

I ask especial attention to this statement because a long experience in the practice of medicine in Florida, whither thousands of persons similarly affected have been sent by physicians, warrants the declaration that thus is laid the foundation for a very large per centage of cases of tuberculosis. Disease of the respiratory organs, particularly pneumonia, when imperfectly cured, establishes the acquired predisposition—furnishes the nidi for the successful invasion of the tubercle bacilli and the resulting development of tuberculosis.

If physicians will not deem their cases of pneumonia cured as soon as the acute symptoms subside, but will continue treatment till inflammation disappears and hepatization is resolved, or till the air can be heard entering every lung cell, there would be neither "troublesome cough nor dyspnoea" as a sequence, and the number of cases of tuberculosis would be largely lessened by prevention.

But this case inculcates another important lesson, viz.: That great altitudes are positively harmful to persons with diseased or enfeebled respiratory and vascular organs. Nothing can be more unphilosophical than advice that will impose upon diseased or enfeebled lungs or heart greater labor than nature has assigned to either in a healthy condition. The standard rates for pulse and respiration in health have been fixed, from which great altitudes, with resultant rarified air, imposes wide departure. It were as serviceable to establish a dilute dietary, with a minimum of nutriment to one whose digestive powers are deranged, instead of concentrated digestible, or predigested food, as to recommend attenuated air to one who needs all the oxygen that the densest atmosphere affords.

The lady described by Dr. Gove died from want of oxygen. She was suffocated.

The next case described was that of "a young woman previously healthy, excepting occasional attacks of asthma." On his second visit she was "laboring for breath, face purple, pulse too rapid to count, and plenty of moist rales in both lungs."

This was a typical case of severe double pneumonia. The treatment consisted, among other things, of bloodletting, which was repeated, and resulted each time in ameliorating the worst symptoms. The treatment under the circumstances was judicious; for the abstraction of blood was, in effect, the removal of so much of the circulating fluid, all of which was poisoned by an excess of carbonic acid, as could not otherwise be eliminated, or be oxydized in the congested lungs. The lungs were incompetent to perform their function notwithstanding labored and rapid respiration. It was eminently sensible to take off a part of the load.

But suppose in that and in the former case oxygen had been artificially supplied. Would not relief to the young woman have been instantaneous and great without the shedding of the vital fluid? And had oxygen been administered to the lady who suffered so intensely from the absence of a necessary supply of that essential in the rarefied air of great altitudes, and died in consequence, would not her suffering have been averted and her life saved? I think so. And this leads me to suggest that in every case where respiration is dangerously impaired, oxygen should be artificially administered. Suppose the lady had been furnished a sufficient supply of oxygen, and a suitable apparatus for inhaling it, with instructions to use them as she ascended the heights, would she not have crossed the mountains in comfort—would not her life have been saved?

If suitable apparatus shall be invented, and all travelers who make the trans-continental journey use it, will not the trip be made with less danger to invalids and with greater comfort to all?

The suggestions of this article have, to a very limited extent, been acted upon by myself, with encouraging results, and I therefore offer them to the profession.

GEO. TROOP MAXWELL, M. D.

Jacksonville, Fla., March 9, 1897.

A MICROBE-PROOF HOUSE.

Living in a glass house is supposed to be attended with disadvantages. In such an abode the privilege of stoning one's neighbor is denied. Being thus placed on exhibition, as it were, a person is under the necessity of behaving himself properly all the while—something that requires a little effort on the part of at least some people. The glazier's services would be in frequent demand, too, it would seem, for purposes of repairs, when the whole mansion was one vast bay window. Moreover, the precedents established by hothouses suggest the probability that occupants of such a dwelling would be experiencing an endless Turkish bath. Nevertheless, there is in Yokohama a human home, very different from ordinary houses, but possessing several distinct charms, and

This queer residence was conceived by Dr. W. Van der Heyden, of Utrecht and Yokohama. He is a bacteriologist. Men of his particular profession, no matter how sober, suffer from a variety of "horrors" closely approaching the inebriate's "jim-jams." They perpetually see microbes in the air, microbes in the water, microbes in their food. Their clothing, their rugs, their curtains and their furniture, the money which they finger, yea, the very lips that they kiss, are all contaminated, at least in their imaginations, with countless bacteria, many of which are of the most baleful character. And so while Dr. Van der Heyden has sought other scientific objects also in the construction of this experimental dwelling, his chief aim has been to devise a sanctuary to which the germs of disease could not penetrate. The edifice stands, appropriately, on the grounds of the general hospital of Yokohama.

Roughly estimated, the dimensions of this house are as follows: Length, 44 feet; breadth, 23; height, 17. Large panes of glass fully half an inch thick are arranged about four inches apart, and set in an iron frame so as to form the sides of a cellular building block. The blocks are fastened together at their ends, as well as their upper and lower edges, by screws, and between one tier and the one above are interposed strips of felt and a board not over five inches wide. In this manner dust-tight, insect-proof joints are secured. There are no window sashes. A row of small openings around the upper part of the second story allow the escape of air from within, but admit no outside air. There isn't a crack anywhere. Entrance is effected through a long corridor leading to the lower room, and a visitor reaches the upper room by means of a staircase. Doors are so arranged in the corridor that almost no air can get in with a person except that which is already entangled in his clothing. There are gratings in the floor of the upper room to admit air from below, and plates of glass to assist in lighting the lower apartment, which is partially under ground.

What is intended to be the sole supply of air is obtained at a considerable distance, being forced through a pipe and carefully filtered with cotton wool before it reaches the dwelling. In this manner most of the microbes are excluded. But to make the sterilization more complete, the air is driven against a glycerine-coated plate on entering the lower rooms, and any microscopic life which passed the cotton wool is captured by a substitute for sticky fly paper. Inasmuch as strong sunlight kills nearly all bacteria, there is another agent at work destroying possible survivors, and, if necessary, the floors and walls can be sprayed with disinfectants. In spite of all these precautions, a few bacteria do get in, probably in the clothes of people who have been out of doors, but they don't stand much chance of living long, much less of multiplying. An evidence of the sterility of the air in this house is found in the fact that milk and unsalted butter remain sweet much longer than elsewhere. The impurities due to breathing and other causes are carefully absorbed by chemicals before the air is driven out through the perforations near the roof.

Another remarkable feature of this experiment is still more interesting than those just mentioned. The space between the two thicknesses of glass in the walls is filled with a solution of certain salts, alum or soda. Now, when the sunshine strikes the house (which stands out unshaded in an open tract) the liquid absorbs

the solar heat, which, consequently, does not penetrate to the interior, except very gradually. At the hottest hour of the hottest day, therefore, it is several degrees cooler in the upper room of this dwelling than in the shaded apartments of the adjacent residences where there are windows and doors wide open. The place is made even more comfortable by drying the air with chemicals before it enters.

On the other hand, the chill of evening is offset by radiation from the warm water in the walls. As the water itself cools, it precipitates a part of the salt held in solution. This operation releases still more latent heat. So effective is this system in regulating the temperature of the room that even in freezing weather a few hours of sunlight daily are sufficient to render the place habitable. It is only when several cloudy days occur in succession that artificial heat is needed. This is supplied through the medium of the filtered air, which is pumped in. The quantity of fuel consumed for this purpose in the course of a winter is insignificant.—*New York Tribune.*

THE CLIMATE OF PALESTINE is very varied, a circumstance due to the great university of level, which embraces a range of 10,500 feet, extending, as it does, from the summit of Mount Hermon to the surface of the Dead Sea. The consequence of this is, that among the plants and animals which it contains there are representatives of the flora and fauna of every other region of the globe, from the Arctic to the tropics. The plants of Northern Europe flourish on Lebanon, those of Central Europe at the level of Jerusalem and Carmel, and those of the West Indies on the plain of Jericho near the Jordan; while as for the animals some of them represent denizens of Alpine districts, and others the fauna of the plains of India and the rivers of Africa, thus supplying a natural symbolism that would appeal more or less intelligibly to men of every nation. As climate has much to do with health in the case of most men and women, the above data will enable future intending settlers to select the one most congenial to their ailments.

WHAT CATSUP CONTAINS.—W. T. Wenzell, the chemist to the San Francisco Board of Health, reports among other curious discoveries that the "New Process" catsup manufactured by John Loeffler in that city, contains large quantities of salicylic acid and coal tar. The acid is used as a preservative and the tar for coloring.

much more frequent than in the army. It is the cause of nearly one-fourth of the deaths.

PIGMENTARY CIRRHOSIS.—M. Letulle, Progres Med., 13th February, in a long communication, describes three cases of pigmentary Cirrhosis not of diabetic origin, in which he made autopsies. All the organs except the eye and the pineal gland were examined. All were gorged with pigments, except the spleen. He described three kinds of pigment; the ocher, the yellowish brown and the black pigment.

SALYCILATE OF METHYL.—M. Gilbert Lassere proposes—Gazette Hebdomadaire—the internal use of Salycilate of Methyl chemically pure, in the treatment of rheumatism; the following is his formula:

Salycilate of Methyl chemically pure 1 c. c.
Syr. simple.
Aquae distil, aa, 100 gr.

To be taken in spoonful doses in twenty-four hours. The patient absorbs 50 per cent. of the solution. The essence of wintergreen does not produce the same result.

Dr. Le Strat has defended a thesis on the local anaesthetic and anti-rheumatismal effects of the salycilate of methyl when applied cutaneously.

The results of his experiments are that the skin absorbs the salycilate of methyl and the remedy thus enters the circulation, and acts on the rheumatic virus. The cutaneous absorption, independent of its entrance through the lungs, is according to the experiments of M. Le Strat, of undoubted effect. The salycilate of methyl undoubtedly acts with much greater intensity when absorbed by inhalation through the lungs. Diseases that are treated with friction with the essence of wintergreen absorb the remedy by the skin and the lungs at the same time. Rheumatic patients are able to use inhalations through cigars filled with sawdust saturated with the salycilate of methyl with great benefit in very many cases.

BROMOFORM IN WHOOPING-COUGH.—In the treatment of Whooping-cough, Bromoform has been found to act very satisfactorily, but its administration has been found difficult because it does not readily combine with the usual excipients. M. Marfan—La France Medicale, 26 February, has presented the following formula:

℞ Bromoform .....gtt. xlviii.
Oil sweet almond.....gr. 15
Gum arabic.....gr. 15
Cherry laurel water.....gr. 4
Distilled water, g.s., ad 120 cent.

Cub.—Mix the bromaform and the oil and shake well, then add the other ingredients.

A teaspoonful contains two (2) drops of bromoform. For child one year, one drop of bromoform; increasing one drop for each year of age.

For reasons given they should not be given in diseases of the digestive organs, and it is contra-indicated in all forms of cutaneous diseases. In extensive burns bromides are injurious by still further diminishing reflex excitability and by their injurious effects on perspiration, the radiation of caloric, the elimination of gases and the cutaneous secretions. Bromides are very slowly eliminated; three weeks after the patient has discontinued their use the bromide is found in the saliva and in the urine.

The effects of a bromide may be very active in all cases of renal disease, on account of the interference with elimination. For the same reason it is inadmissible in cases of diabetes. In all diseases the use of bromides may increase the inflammatory condition. Bromide preparations are eliminated through the milk, and consequently they should not be prescribed for nursing women. Evidently the bromides are distinctly contra-indicated in some forms of nervous diseases.

THE USE OF BROMIDES.—Dr. Sterling, in the Wiener Med. Blaet., insists very urgently against the abuse of bromides, and points out their danger. These preparations are generally used as if they were harmless, or nearly so. Generally, the bromides, given in moderate doses and for a short time do not cause any serious disturbance in the system. But, it happens sometimes, that small doses, or even a single large dose may cause very serious results; a jaundiced coloring of the skin, paralysis of the central nervous system, disturbance of digestion, etc. Prolonged employment may lead to loss of memory, impairment of sight and of hearing, of the cutaneous sensibility, uncertainty in the act of locomotion, somnolence, gastro-intestinal disturbance, anemia and extreme emaciation, cutaneous eruptions and a catarrhal condition of mucuous tissues.

Bromides should not be prescribed for those suffering with neurasthenia and those who are already anemic. Those who are

phthisical do not bear it well. Its influence on nutrition is generally injurious and it gives rise to a catarrhal condition of the air passages. The diminution of the reflex excitability prevents the expectoration of the mucous.

LARYNGEAL OR WINTER COUGHS.—Dr. Walter M. Fleming, of New York, in giving his experience in the treatment of laryngeal cough and allied disturbances (Journal of Nervous and Mental Diseases), submits the following:

"In acute attacks of laryngeal or winter cough, tickling and irritability of larynx, faith in antikamnia and codeine tablets will be well founded. If the irritation or spasm prevails at night the patient should take a five grain tablet an hour before retiring and repeat hourly until allayed. This will be found almost invariably a sovereign remedy. After taking the second or third tablet the cough is usually under control, at least for that paroxysm and for the night. Should the irritation prevail morning or mid-day, the same course of administration should be observed until subdued. In neuroses, neurasthenia, hemicrania, hysteria, neuralgia and in short, the multitude of nervous ailments, I doubt if there is another remedial agent in therapeutics as reliable, serviceable and satisfactory; and this, without establishing an exaction, requirement or habit in the system like morphine.

"Finally, in digestion, gastritis, pyrosis, nausea, vomiting, intestinal and mesenteric disorders and various diarrhoeas, the therapeutic value of antikamnia and codeine is not debatable. The antipyretic, analgesic and antiseptic properties are incontrovertible, and therefore eminently qualified to correct the obstinate disorders of the ailmentary canal."

NEURASTHENIC INSOMNIA.—In a practical article on the treatment of insomnia, Dr. O. Dornbluth (Aerzt. Centr. Anz.), has recently called attention to the fact that the disorders of sleep, which apparently occur as independent affections, usually allied with or comprising the chief system of neurasthenia or the nervous diathesis, are especially difficult to cope with. While normal sleep can frequently be brought about by general treatment, more often it is necessary to treat the insomnia itself. A distinction should always be made between acute and chronic cases. If the insomnia be due to exhaustion, over-exertion, emotional causes, etc.—no matter what other nervous troubles coexist—the indication for medicinal soporifics presents itself. For this purpose the author has found Trional the best remedy. It is his custom to prescribe

it in tablet form, r.5 Gm. on the first evening, one hour before retiring, in a wineglassful of milk. If satisfactory sleep is obtained the first night it is sufficient to administer 1.0 Gm. the following evening; on the other hand, if sleep is unsatisfactory, the initial dose should be repeated, or even increased to 2.0 Gm. Should the remedy be given continuously for a number of days, it is advisable to let the patient drink one or two bottlefuls of some carbonated alkaline mineral water daily. In cases of insomnia of long duration, however, further measures are indispensable. Care should be taken that the bedroom is well ventilated, thoroughly darkened, and slightly warmed in the winter; the bed should be comfortable and the coverings not too warm; the pillows should be so arranged that the patients head is neither too high or low. Supper should be taken at least three hours before bed-time, tea, coffee, etc., being avoided. Sometimes, however, a glass of lemonade or milk, taken when the patient is in bed, is of service. Gymnastic exercise and walking should be indulged in before the evening meal. A warm sitz-bath of short duration immediately before retiring is also a valuable adjunct in the treatment of many of these cases.—"Cincinnati Lancet-Clinic," December 5, '96.

"Coca Wine and its Dangers" (British Medical Journal) is suggestive of various meretricious and dangerous imitations of the standard French preparation, Vin Mariani, which is so generally well known to and approved of by physicians, that it would be superfluous for us to recapitulate its virtues. The so-called "coca wines" referred to, are generally solutions of the alkaloid cocaine, in sweetened wine of a low grade (artificial wines). Quantities of such stuff have been seized by various health authorities and destroyed. The danger in the use of such preparations is apparent. They are causing misapprehension of and working an indirect injury to a really valuable drug, for the usefulness and safety of coca, when properly prepared and administered, have long since been recognized.

Physicians will not encounter disappointment whenever using the standard French coca wine, Vin Mariani, as an adjuvant in treatment, as a tonic-stimulant and restorative in cases of depression, anaemia and exhaustion. It has stood the test in practice during nearly thirty-five years. Physicians, therefore, when prescribing coca, should be careful to instruct their patients to procure "Vin Mariani," to avoid the unpleasant after effects common to fraudulent imitations.

EDITOR'S TABLE.

SANITARIAN, APRIL NUMBER, 1897.

☞ ALL correspondence and exchanges and all publications for review should be addressed to the Editor, DR. A. N. BELL, Brooklyn, N. Y.

MORE ABOUT THE BROOKLYN WATER SUPPLY.

The "New York Tribune" of February 14th, reports an interview with Chief Engineer Birdsall of the Croton Aqueduct, who said that the Croton watershed would be sufficient to supply the needs of the present New York city, allowing for the normal rate of growth, for fifteen or twenty years. He did not think it would be wise to draw on the Croton region for the sake of helping out Brooklyn after consolidation, in case of a short supply in that city. Brooklyn, in his opinion, would have to go further out on Long Island, and he believed that plenty of water could be found there—enough to last that city for many years. At the same time Mr. Birdsall expressed much interest in the plan for determining the feasibility of securing water not only for Greater New York, but for other cities, either from the Adirondack region or the Great Lakes.

"How much more water can be drawn for New York from the Croton region?"

"From 150,000,000 to 160,000,000 gallons a day. I think we can get enough to last the city fifteen of twenty years, at the present rate of consumption. We are now taking about 220,000,000 or 230,000,000 gallons a day. There is a bill at Albany to prevent us from purchasing any more land in Westchester County, but I do not think it will pass. We need to take about 15,000 acres more."

"Would New York be able to furnish any water to Brooklyn after consolidation, in case the supply in that part of the city got short?"

"I do not think it would be wise to do that. Brooklyn can get plenty of water by going out further in Queens and Suffolk counties. The trouble over there is that they are not willing to buy enough land, but they sink wells and thus drain water from a large area. It has to be taken from somewhere, and what the people on the island object to is having their water taken in this way without their leave. So they have sought legislation to restrict the Brook-

lyn authorities. But I have no doubt that there is plenty of water to be obtained by that city until such time as a larger supply is furnished to these and other cities by the State, the cities, of course, paying for it in proportion to the quantity they use."

THE SANITARY RELATION OF CLEANLINESS was the subject of a lecture, by Col. Waring, under the auspices of the Board of Education, at Cooper Union, March 6th. He cited in evidence the great change that has come over New York during the last two years, in part, as follows:

"The deaths for the last three months—Nov. 21 to Feb. 20—averaged 681 per week. The average for the same period in the preceding ten years was 913. In other words, there were 232 fewer deaths per week during these three months than the average for ten years before. If the same condition prevails throughout the year, the total saving of life will be 12,064.

"Another set of deductions made by the Board of Health from its statistics is based on the death rate of January for eight years, beginning with 1890. The average January death rate for the first six years of this period was 27.51 (for January, 1895, it was 26.77). One year after Mayor Strong's inauguration, the January death rate (1896) was 22.69, and now, after the city has been kept clean for two years, and the poorer people have been able to live in a more healthful way in consequence, we have a rate for January (1897) of only 19.18. This proportion, if continued for a year, would indicate a saving of 16,367 lives.

"Consider for a moment what this means. It means a saving that might have been made every year equal to the entire population of many of our thriving and important manufacturing towns; it means that the unnecessary loss of so many lives for six years is equivalent to the complete extermination within that time, by some great catastrophe, of all the inhabitants of Danbury, New London, and Pittsfield, in New England, and of Orange, Passaic, and Plainfield, in New Jersey. Greater cleanliness has helped us in getting the better conditions with which we are now blessed. It means also something far more significant than this. Assuming that there are twenty cases of sickness for every death, it means the avoidance of over 300,000 cases of illness, with all their attendant suffering and cost.

"Of course, other causes have helped to effect this saving of health and life, but no intelligent person will doubt that improved cleanliness, in the house and outside of it, has been a chief factor in

lessening the prevalence and fatality of disease. The removal of snow from the streets, especially in the poorer quarters, has undoubtedly been of great service. Whatever the favoring causes may have been, there are to be remembered, on the other hand, the poverty, overcrowding, and defective nutrition that have been so marked in these dull times, and have had so depressing an influence on the public health."

INCOMPETENT MIDWIFERY.

The censure of the New York Board of Health by the Coroner's jury, noticed in our March number, has enlivened attention to the subject by the physicians of the city. Coroner Tuthill is said to be engaged in preparing a bill for the Legislature to regulate the practice of midwifery. He has committed himself to a vigorous crusade against the incompetent midwife. He says he will not rest until there is passed some kind of a law regulating their work.

He justly asks, "Why should the Board of Health accept a certificate of birth signed by a person whose name would not be worth anything when attached to a death certificate? I tell you, midwifery as practiced in New York is a crime. It is not only criminal toward the infant; it is a crime against the mother and a gross and expensive burden upon the city and State. No woman should be allowed to practice midwifery as a business unless authorized to do so by a board established by law. Then the penalties for malpractice connected with confinement cases should be made severe enough to make the ignorant hesitate before going into it.

"As it is to-day anybody, even a man, can set up as a midwife. There is absolutely no law whatever on the subject. There are, on the other hand, thousands of young regularly graduated physicians who would be glad in the cause of humanity to take the cases for nothing. There are many others who would be willing to act for the small fee that the average midwife gets. She charges as a rule from $5 to $10, and if there are any complications she has to send for a physician, frequently too late to be of service to the patient. God only knows how many still-births are due to the incompetence and gross ignorance of the midwife."

Dr. Roger S. Tracy, register of records of the Board, says that of the births that take place in this city 47 per cent., or nearly one-half, are attended by midwives. The other 53 per cent. are reported by physicians. It is only when a midwife reports a birth in person that she can be induced to sign the Board of Health register.

The register of the Board of Health, therefore, is a farcical pretense. It means nothing. Most of the midwives that sign the book do so under the impression that the act gives them a license for practicing midwifery for nothing. Coroner Tuthill says that most of the midwives with whom he has to deal—and he officiates only when a death has resulted—are firmly convinced that they have a licence from the Board of Health.

In Brooklyn, the ratio of labors attended by midwives is still larger than that of New York. And here as there, the Health Department gives no attention to their practice except in cases where still births are reported. The registration which requires no certificate of competency is a farce—a mere announcement of privilege to assume the risk to protect life without a knowledge of the means of doing so under untoward conditions ever liable to occur.

THE NEW MARRIAGE LAW.—The Bill introduced into the N. Y. Assembly by Mr. Austin, March 7, provides for three classes of marriage—first, the ceremonial marriage; second, the common law marriage, and third, foreign marriages.

For the ceremonial marriage a license must be issued by the local Board of Health of the town, village or city where the application is made. All vital statistics are now required to be registered with the local boards of health, hence no new office is created by the bill. Upon production of the license any one authorized by law to perform the marriage ceremony may solemnize the marriage of the persons named in the license. Within a time prescribed, the person officiating must cause a return of the marriage to be made to the local Board of Health, in substantially the same manner as now required by law. He must also, if requested, as now required by law, deliver a certificate of marriage to the parties, who may file the same with the local Board of Health, with the same effect as the official return of the marriage.

The common law marriage, that is, marriage by verbal agreement merely of the parties, is preserved, but such a marriage is void unless the declaration, acknowledged in the same manner as to entitle a deed to be recorded, is filed with the local Board of Health. From the time such a declaration is filed, the parties are deemed in law husband and wife. The nullity of any marriage contracted by verbal agreement merely, in a manner other than as above required, may be decreed, not only in a direct action or proceeding brought for that purpose, but in any collateral action or proceeding where a substantial interest is affected, only so far, however, as such interest is affected by the marriage.

When residents or a resident of this State are married in another State in conformity with the laws of such State, and subsequently take up their residence here, they must file with the local Board of Health a certificate containing substantially the same information that is required in the return of a ceremonial marriage. A fine is inflicted for a failure to obey this requirement. This is designed to meet the case where residents seek to evade the home law. When the husband only is a resident of this State he alone is liable to the fine.

All records of marriages must be returned by the local boards to the State Board of Health at Albany, so that there is one central place in the State where all marriages are recorded. The bill is so drawn that any one purchasing real estate is protected from dower claims in the same manner as from mortgages, judgments or other incumbrances not properly recorded.

FREE MEDICAL SERVICE IN NEW YORK.—A committee of the New York County Medical Society, has for some time been engaged in an investigation of the system, or rather lack of system, of dispensing free medical aid in that city. Dr. Landon Carter Gray, President of the Society, in an address which is the basis of the present investigation, showed by figures for the year 1895, that very nearly half of the inhabitants of New York County are either paupers or are willing to have themselves considered as such for the sake of obtaining medical attendance and supplies without cost. There is no intention on the part of those who are engaged in the investigation to stand in the way of the giving of the medical aid that may be needed in the emergencies of life. "But," says Dr. Gray, "there really does not seem to be much likelihood of such a grievance, when 949 physicians, out of a total of 3,430, treated 737,171 patients in one year, made 1,479,644 free visits, and wrote 1,104,381 prescriptions, besides paying due attention to the other duties incidental to attendance upon 26 hospitals and 114 dispensaries."

THE WOMAN'S HEALTH PROTECTION ASSOCIATION.—At the regular monthly meeting in New York, March 2, the chief topic of discussion was the project of forming a national organization, introduced by Mrs. J. H. Scribner, of the Philadelphia organization, and advocated by Mrs. Charles Brush of Brooklyn. It was vigorously opposed by Mrs. Ellen Scrimgeour, President of the Brooklyn Health Protective Association, in opposing the motion, Mrs. Scrimgeour said:

"If anything in the world to-day needs the attention of women, it is the home. We are doing too much altogether, and the men are willing that we should. We must spur the men up, and let them see that we know the laws and mean to have them enforced. We feel that we are a power in our city, and will not stand for men who advocate unrighteous things."

The matter was finally laid over until the annual convention, which will be held in Philadelphia on April 29 and 30.

FREE HOSPITAL FOR CONSUMPTIVE PHYSICIANS.

Dr. Paul Gibier, of the Pasteur Institute, announces that he has established a hospital in connection with the institute for physicians suffering from tuberculosis.

It has seven rooms, and physicians will be treated free of charge. In case the rooms are not occupied by physicians they will be at the disposal of other professional men.

AN ENTERPRISING UNDERTAKER.—"That's a funny thing," said Dr. West, secretary of the Brooklyn Health Department, as he turned away from the telephone, the other day, and addressed several department physicians in the inspector's room. "An undertaker called up some time ago and said he wanted a burial certificate. Now he telephones us that he doesn't believe he needs the certificate just now as the corpse has not yet died." Everybody laughed, except Dr. Pray, who, with a woman's warm sympathies, promptly decried the apparent eagerness with which some undertakers sought to get the dead under the ground. Then she told of an undertaker who had called upon her for a death certificate in the case of a child that she had attended. The undertaker was in a hurry, in order that he could make arrangements for the opening of a grave, but finding that the man was not certain of the child's death she refused to issue the certificate and repaired to the house of the patient to find that the child was still alive, although its death occurred shortly afterwards. "The issuing of a death certificate upon an undertaker's application," commented the doctor, is a bad practice on the part of physicians, and should never be done until the physician has first satisfied himself that death has really taken place.

PERIPATETIC DANGER LEGALIZED.—The Supreme Court of Wisconsin has decided that the State Board of Health has no right to vaccinate against his or her will any person who claims exemp-

tion on the ground that he or she regards the operation as "morally wrong and in violation of the laws of God."

Per contra: "Voluntary exposure to unnecessary danger and hazardous or perilous adventure," in an insurance policy, means wanton or grossly imprudent exposure, Manufacturers Acc. Indem. Co. *vs.* Dorgan (U. S. C. C. A.), 58 Fed. Rep., 945.

To refuse vaccination is to incur the risk of death from smallpox, which, according to this decision, forfeits the benefit of life insurance. Besides this, however, the person who "deems vaccination morally wrong and in violation of the laws of God," is, according to the judgment of the Supreme Court of Wisconsin, usually right in not only hazarding his own life by wilful exposure to unnecessary danger, but in hazarding the lives of other persons, in the event of his contracting smallpox, by disseminating the poison. A more illogical and dangerous decision is inconceivable.

PENALTY FOR INDIRECT MURDER.—Dr. St. Clair Thompson, London correspondent of the "Therapeutic Gazette," reports a verdict that has lately been obtained which, if upheld, as it deserves to be, in England, and imitated in this country, will enable us to do with very little more sanitary legislation. At the Birmingham Assizes a special jury did the work of many Acts of Parliament by giving tremendous damages against a "local authority" which had poisoned a citizen with sewer gas. The citizen was a Mr. Smith, and an action was brought on behalf of his widow and six children against a rural District Council whose sewers were found to "ventilate" into his house. This, it was alleged, gave him typhoid fever, whereof he died. An entirely unsolicited supply of sewer gas to Mr. Smith's premises was cut off, some time ago, by order of the District Council. But the work was done in a slovenly way; and it was held that the leakage accounted for the disease. The plaintiffs claimed $50,000; the jury gave them $17,500. An effective penalty like this will make "local authorities," in vulgar parlance, "sit up," and will show that sanitary legislation is not a new expression of opinion.

GAS POISONING.

In Boston, Jan. 18, there were reported seven deaths caused by the inhalation of illuminating gas. Three of the victims were children, and it does not appear that any one of the remaining four committed suicide, although in the cases of these there was evidence of gross carelessness in the handling of gas burners.

There has been a notable increase in Boston during the last few years, and since the introduction of water gas, of deaths caused in this way. Dr. F. W. Draper, Medical Examiner in that city, has prepared the following tabular statement, based upon the official records:

	Suicides.	Accidents.	Total.
1889	—	1	1
1890	—	4	4
1891	2	1	3
1892	10	5	15
1893	3	3	6
1894	9	9	18
1895	5	9	14
1896	7	24	31

"The sudden rise in the mortality rate in 1892," he says, "was something more than a matter of chance; it was coincident with the manufacture and distribution of water gas. Before the change was made a death by coal gas was a rare event, but now the cases are numerous enough to be no longer novel." We have not at hand the statistics of other large cities relating to this subject, but we presume that they would disclose an increase. It has been generally noticed that while in the days of coal gas the recovery of persons found in an unconscious condition in rooms where gas had been escaping was frequently reported, a majority of those now found in rooms full of gas are either dead when discovered or beyond all hope of resuscitation.

This is explained by the fact that the water gas now used in many American cities is four times as poisonous as the old coal gas. That is to say, it contains four times as much carbonic oxide. The coal gas formerly used in Boston, for example, contained 7 per cent. of this poisonous substance, while the water gas now distributed there contains from 29 to 32 per cent. of it, according to the statement of the local authorities. Before the introduction of water gas the law in Boston forbade the manufacture and distribution of gas containing more than 10 per cent. of this deadly carbonic oxide. That law has been repealed.

It appears that gas made in the same way and designed to be used exclusively as fuel—non-luminous water gas—is much more dangerous or poisonous than that which is distributed for illuminating purposes. Prof. Wood, of the Harvard Medical School, points out that nearly 50 per cent. of the volume of this gas is carbonic oxide, and that it is almost odorless. Because it has scarcely

any odor, the escape of such gas from defective pipes and the diffusion of it through the air of an inhabited room could not easily be detected. In the case of the illuminating gas, however, the addition of "enriching" substances imparts to the compound an odor which attracts the attention of consumers, if they are awake and in possession of their senses. Coal gas has been displaced by water gas in many cities because the cost of producing the latter is so much lower.

Consumers should be instructed as to the poisonous quality of water gas, the danger attending a careless handling of gas fixtures by means of which such gas is distributed, and the necessity for watchfulness by which the occupants of dwelling houses can be protected against gas leaking from defective pipes. Several years ago Dr. Raymond, when Health Commissioner of Brooklyn, suggested that he ought to be empowered and enabled by a small appropriation to analyze frequently the gas used in this city. Municipal health authorities may properly and to the advantage of citizens undertake not only the suggested chemical inspection, but also the work of enlightening, instructing and warning gas consumers against the danger of impure gas.

MORTALITY AND MORBILITY REPORTS AND REVIEWS.

Correspondents under this head are particularly requested to be as prompt as possible.

ALABAMA.—W. H. Sanders, M. D., State Health Officer, Montgomery.

Mobile, 37,817: J. A. Abrams, M. D., Health Officer, reports for January: Deaths, 98—28 under five years of age. From consumption, 12; annual death rate, 30.12.

CALIFORNIA.—J. H. Davidson, M. D., President, Los Angeles; J. R. Lane, M. D., Secretary, Sacramento. The Secretary reports for January: Returns from 53 cities, towns, villages and sanitary districts, aggregating a population of 750,611, show a mortality of 1,135—a death rate of 1.51 per 1,000, or an annual death rate of 18.12. 191 were from consumption, 128 from pneumonia, 43 from bronchitis, 14 from congestion of the lungs, 20 from diphtheria (and croup), 24 from typhoid fever, 3 from malarial fevers, 11 from cerebro-spinal fevers, 47 from cancer, 4 from erysipelas, 122 from dieases of the heart, 4 from alcoholism.

Reports of prevailing diseases from 30 localities outside of the larger cities and towns give 60 cases of pneumonia, 153 of bronchi-

tis, 37 of pleurisy, 34 of congestion of the lungs, 25 of croup, 224 of measles, 26 of whooping cough, 300 of la grippe, 27 of typhoid fever, 69 of malarial fevers, 2 of cerebro-spinal fevers, 14 of erysipelas.—Veterinary Surgeon O'Rourke has reported to the Board of Health that of 1,700 cows examined by him, 300 were afflicted with tuberculosis and should be killed.

San Francisco, 330,000. Reports for January: Deaths, 613—128 under five years of age. From consumption, 87; acute pulmonary diseases, 106; from zymotic diseases, 48; diphtheria (and croup), 11; typhoid fever, 13; annual death rate, 20.7. Contagious diesases reported during the month: Diphtheria, 24; scarlatina, 22.

Los Angeles, 100,000. Reports for January: Deaths, 131. From consumption, 37; acute pulmonary diseases, 12; diphtheria, 2; typhoid fever, 2. Annual death rate, 15.7.

Oakland. Chinese spraying clothes with their mouths is reported to be a dangerous feature of the laundries that requires suppression. Health Officer Bradley says, "there is no doubt that the habit of spraying clothes with the mouth is a dangerous one and should be stopped. Not only consumption but other constitutional diseases are apt to be spread in this manner."

Dirty towels in the schools have also arrested the attention of the Board of Health. One school had been reported where there was but one towel for 200 boys! There had been one case of ophthalmia reported from the use of a towel.

COLORADO.—Denver, 150,000. William P. Munn, M. D., Health Commissioner, reports for the week ending February 20: Deaths, 42. Of these 6 were caused by consumption, 5 by pneumonia, 1 by diphtheria, 4 by measles, 2 by whooping cough, 2 by typhoid fever and the rest from scattering causes.

CONNECTICUT.—Professor William H. Brewer, Ph. D., New Haven, President; Professor C. S. Lindsley, M.D., Secretary, New Haven.—The Secretary's bulletin for January comprises reports from 166 towns in the State, with an aggregate population of 851,060, from which the number of deaths reported for the month was 1,123. The death rate for the larger towns is 15.6; for the smaller, 16.4, and for the whole State, 15.8. Deaths from zymotic dieases, 103—9.1 per cent. of the total mortality—chiefly from diphtheria (45), typhoid fever (7), and scarlet fever (4;); from consumption, 99; pneumonia, 163.

DISTRICT OF COLUMBIA.—Washington Sanitary Improvement Company, an organization which has lately come prominently to the front, in conjunction with the Citizens' Central Relief Committee, a committee of the Civic Center, and the charities committee of the Board of Trade, are earnestly engaged in the philanthropic purpose of providing homes for the poor. A public meeting was held under its auspices February 20th, at which prominent men, who are giving aid to the enterprise, were present, and speeches made calculated to enlighten the public as to what was desired. One of the duties imposed upon the Central Relief Committee by the District Commissioners was to devise measures of permanent relief for such dwellings, and a sub-committee, of which Surg. Gen. Sternberg is chairman, was appointed to consider the matter. They submitted to the Relief Committee some time ago a report, which was indorsed, giving statements regarding the conditions of the alley residences and their population, and recommending a plan for the organization of the improvement company, somewhat similar to those in other cities, which have proved philanthropical and financial successes. The plan has already met with much approval among business and professional people, and many subscriptions to the stock have been received.

Justice Brewer presided at the meeting, and among others present were Dr. Elgin R. L. Gould, of New York; Commissioner Ross, Dr. Radcliffe, Gen. Sternberg, S. W. Woodward, Health Officer Woodward, and Rev. Dr. Ennis. After a prayer by Dr. Radcliffe, Justice Brewer explained the object of the meeting, and said that the permanent relief of the residents of the slums of great cities could not be accomplished merely by the giving of money and provisions. Some other way must be taken to elevate those who were in the lower levels amid vice, crime, and want.

"As is the home," said Justice Brewer, "so is the life; out of the clean home comes the clean life, and out of the unclean home the unclean life. If we can reach the homes of the poor, cleanse them or substitute for them clean and better homes, we will be doing a great thing to bring clean lives to the city." He introduced Dr. Gould, who is President of the City and Suburban Homes Company, of New York, and an economic scholar of high standing. Subject of "model housing," as it is called, is one to which he has devoted much attention, with good results.

Bishop Satterlee and Dr. Sternberg followed with remarks pertinent to the subject. After which committees were appointed in promotion of the purpose and to concentrate effort.

FLORIDA.—Hon. W. B. Henderson, President, Tampa; Joseph Y. Porter, M. D., State Officer, Jacksonville.

Pensacola, 15,000. B. R. Pitt, President, reports for February, 17 deaths—3 under 5 years of age. Annual death rate, 13.6. From consumption, 3.

ILLINOIS.—William E. Quine, M. D., President, Chicago; J. W. Scott, Secretary, Springfield.

Chicago, 1,619,226. William R. Kerr, Commissioner. Report for January: Deaths, 2,026—1,520 under five years of age. From diphtheria, 76; typhoid fever, 38; consumption, 187; pneumonia, 290; bronchitis, 172; measles, 13. Annual death rate, 15.

A correspondent of "The Chicago Evening Journal" say that in the opinion of the valley towns of Illinois the drainage canal project of Chicago is a stupendous failure. Other people outside of Chicago have said the same thing, and have been roundly abused by Chicago for so saying. About $28,000,000 has already been sunk in the enterprise, and it will require about $15,000,000 more to complete it. Nobody seems ready to put up this sum, and, moreover, the valley towns say they don't want the old canal, anyway. It will neither look pretty nor smell sweet. Chicago promised to dilute it with 300,000 cubic feet of water a minute, and now proposes to go back on its promise. Hence the indignation, which, under the circumstances, seems entirely natural.

February 24. Diphtheria is reported epidemic in Rockford and Deerfield.

IOWA.—E. H. Carter, M. D., President, Des Moines; J. F. Kennedy, M. D., Secretay, Des Moines.

Davenport, 35,000.—A. W. Cantwell, M. D., Physician, reports for January. Number of deaths, 50—11 under five years of age. Death rate per 1,000, 17.2.

LOUISIANA.—R. S. Oliphant, President, New Orleans; G. F. Patton, M. D., Secretary, New Orleans.

New Orleans, 275,000.—80,000 colored: Deaths in January, 653; colored, 238—133 under five years of age, 43 colored. Deaths from consumption, 77; pneumonia, 86; bronchitis, 23; cholera infantum, 3; enteritis, 16. Death rates—Whites, 25.54; colored, 35.70: 28.49.

MARYLAND.—John Morris, M. D., President, Baltimore; John S. Fulton, M. D., Secretary, Baltimore.

At a recent conference of the health officers and others interested in the promotion of the public health, "The Maryland Public Health Association" was organized. Privileges of membership is extended to men and women alike, the only requirement being an avowed interest in public health and the recommendation of one active member. The recent conference demonstrated that many sanitary subjects are of general interest and that lay members enter into their discussion with as keen relish as do medical men. It begins with an enrolled membership of 110, representing nearly all sections of the State. The executive committee has outlined a campaign of education, contemplating a corps of lecturers, whose services shall be at the command of school boards and local sanitary organizations at no greater cost than will cover the actual expense to the association. The duties of the lecturers will be not only to talk in an entertaining way, but also to illustrate and demonstrate their subjects. Preventive medicine appears never to have attracted so much interest in the State as it has under the recent reorganization of the State Board of Health, and there is reason to hope that the so-long talked of Sewerage of Baltimore will ere long take practical shape.

Baltimore, 506,398—73,344 colored. James F. McShane, M. D., Health Commissioner, reports for the year 1896. The total deaths were 9,919. Of these 2,307 were colored; a death rate of 17.66 per thousand for the former and 30.76 per thousand for the latter. The death rate per thousand for the whole population was 19.60. 3,035 died from zymotic diseases, 1,122 from consumption, 884 from pneumonia, 60 from influenza, 252 from bronchitis, 253 from Bright's disease, 228 from heart disease, 3,728 or 37.58 per cent. of the total deaths were in children under five years of age.

MASSACHUSETTS.—H. P. Walcott, M. D., Chairman, Cambridge; S. W. Abbott, M. D., Secretary, Boston.

Boston, 501,083.—Samuel H. Durgin, M. D., Chairman of Board of Health. The number of deaths reported to the Board for the week was 250, as against 227 the corresponding week last year, showing an increase of 23 deaths, and making the death rate for last week 25.2. The number of cases and deaths from infectious diseases was as follows: Diphtheria, 74 cases, 13 deaths; scarlatina, 39 cases, 3 deaths; typhoid fever, 4 cases, 3 deaths; measles, 212 cases, 1 death. The deaths from consumption were 33; pneumonia, 54; whooping cough, 1; heart disease, 22; bronchitis, 7; marasmus,

5. There were 10 deaths from violent causes. The number of children who died under five years was 101.

MICHIGAN.—Hon. Frank Wells, President, Lansing; Henry B. Baker, M. D., Secretary, Lansing.

The Secretary reports for the month of February, 1897, compared with the preceding month, measles and erysipelas increased in area of prevalence. Compared with the average for February in the 11 years, 1886-1896, intermittent fever, diarrhoea, consumption, erysipelas, pneumonia and measles were less prevalent. Including reports by regular observers and others, consumption was reported present at 176 places, measles at 101 places; diphtheria at 74 places; scarlet fever at 50 places; typhoid fever at 34 places and whooping cough at 26 places. Reports from all sources show consumption reported at 33 places less; measles at 24 places more; diphtheria at 20 places less; scarlet fever at 13 places less; typhoid fever at 8 places less and whooping cough at 11 places less in the month of February, 1897, than in the preceding month.

Detroit, 275,000.—S. P. Duffield, M. D., Health Officer, reports for January, 386 deaths—164 under five years of age. Annual death rate per 1,000, 16.52. Deaths from consumption, 20; pneumonia, 52; diphtheria, 50; scarlatina, 7; meningitis, 11.

MINNESOTA.—Franklin Staples, M. D., President, Winona; H. M. Bracken, M. D., Secretary, St. Paul.

Minneapolis, 225,602.—H. N. Avery, M. D., Commissioner, reports for December: Deaths, 146—51 under five years of age. Deaths from diphtheria, 10; consumption, 9; typhoid fever, 27. Annual death rate, 7.76. Death rate for 1896, 8.49.

St. Paul, 215,582. A. J. Stone, M. D., Commissioner. Mortality for January, 100—32 under five years of age. Annual death rate per 1,000, 5.55. Diphtheria caused 5 deaths; consumption, 16; pneumonia, 13.

MISSOURI.—F. J. Lutz, M.D., President, St. Louis; Paul Paguin, M. D., Secretary, St. Louis.

St. Louis, 600,000—35,000 colored. M. C. Starkloff, M. D., Commissioner of Health. At a meeting of the Board, March 4, the Commissioner reported on the condition of the tenement houses. The report showed that 4,436 houses had been examined. They contained 50,321 occupied rooms and 5,803 unoccupied rooms; 18,664 families inhabit these rooms. These families in-

clude 74,118 persons, 44,954 being adults and 29,164 children; 81 premises were found to be without city water, and there are 627 wells and 736 cisterns; 39 tenements have less than 600 cubic feet of air space to each inhabitant; 36 have deficient plumbing; in 80 the ventilation is bad; 107 have insufficient light; 204 have filthy closets and vaults; 105 have unsanitary cellars, and 144 are in a general filthy condition. Presenting ample reason, the Commissioner thought, for an ordinance conferring additional powers on the board in order to overcome the existing evils. The matter was laid over to give the members of the board an opportunity to examine the proposed ordinance.

Kansas Ctty, 165,000. E. Von Quast, M. D., Health Officer. There were 171 deaths during January, of which 50 were under five years of age. Death rate per 1,000, 12.43. From consumption, 10; pneumonia, 29; diphtheria, 8.

NEW JERSEY.—C. F. Brackett, M. D., President, Princeton; Henry Mitchell, M. D., Secretary, Asbury Park.

We are pleased to notice a prospect at last of purifying the Passaic. At a meeting of the Newark Board of Trade, March 10, William T. Hunt, one of the members of the State Commission on Passaic River Purification, made an address on the subject of the pollution of the Passaic and the remedies proposed in the plans and estimates submitted by the Commission to the Governor. A bill prepared by the Commission giving authority to the communities along the Passaic to construct a trunk sewer from Paterson to the Bay is now before the State Legislature. Assuming that the enactment will be sufficiently mandatory to accomplish its purpose, it is a prospective life-saving measure to thousands of the present population and of the future generation. The present total population contributing to the sewer, or soon to do so, is put at 436,000, of which Newark would be about one-half. The future growth of the district would, however, be greater proportionately outside of Newark's present boundaries than within them, for the vacant spaces are greater and the benefits of the removal of the pollution would soon be felt in their favor.

Newark, 230,000. Health Officer Chandler reports for the four weeks ending February 27: Deaths, 323—115 under five years of age; from diphtheria, 14; consumption, 36; pneumonia. 30. Annual death rate, 18.2.

Hudson County (Jersey City and vicinity), 355,231. W. W. Varick, M. D., President, reports for January, 520 deaths, of which

156 were under 5 years of age. Annual death rate per 1,000, 17.6. From consumption there were 65 deaths; from pneumonia, 71; from diphtheria, 71; from typhoid fever, 3.

The East Jersey Water Company, which for fourteen months has been furnishing Jersey City with a supply of water from the Pequannock River water sheds, served notice on the city authorities, March 9th, that in the couse of a month or two the supply from the Pequannock will be cut off, or at least reduced, and in that case the city will be obliged to return to the polluted Passaic River for all or a large proportion of its water. The prospect is not contemplated with any great degree of satisfaction by the residents of the city, but it will be a bonanza for the dealers who sell water in two and five gallons demijohns, as the water of the Passaic has not improved since the city discontinued its use.

Paterson, 105,440. J. L. Leal, M. D., Health Officer, reports for January, 175 deaths—67 under five years of age. Annual death rate. 16.63. From consumption, 14; pneumonia, 15; diphtheria, 23; typhoid fever, 10.

Bayonne has recently entered into praiseworthy contract with the New York and New Jersey Water Company for an adequate supply of pure water wholly independent of the Jersey City supply, from which it has heretofore drawn. The water now taken has been running through the twelve miles of thirty-inch pipe from Arlington just long enough to cleanse the newly built main and he various lines in Bayonne. For drinking, domestic and manufacturing purposes the new water supply meets all requirements, and exceeds, according to the analysis of Prof. Charles F. Chandler, the unusually severe standard required by the terms of contract. The supply is abundant, while the pressure is so high, only about one-half the available pressure is permitted by the water department of Bayonne.

New York.—Daniel Lewis, M. D., President, New York; B. T. Smelzer, M. D., Secretary, Albany.

The Secretary's bulletin for January, compared with the preceding month, reports 500 more deaths and a death rate of 17.25 against 16.50; the infant mortality was increased by about 300, and the zymotic mortality slightly diminished. The increase in deaths appears chiefly in acute respiratory diseases. Compared with January, 1896, there were 600 fewer deaths, the death rate then having been 18.75, and both the infant and zymotic mortality are less this month than they were a year ago by between 300 and 400. Grippe

has been reported as the cause of death from all parts of the State, but the mortality from it has been small as compared with that of this month in the preceding years, and it is probable that not more than 300 deaths were attributable to it. Acute respiratory diseases are reported as causing 1,750 deaths, which is less by 250 than in January, 1896 (when 500 deaths were credited to grippe); the relative mortality in urban and rural population from this cause is the same. From other local diseases the mortality was not far from the average. Consumption causes 1,050 deaths, which is below the average for this month, and 100 less than last January. 11.0 per cent. of all deaths were from consumption, 18.0 per cent. from acute respiratory diseases, and 10.4 per cent. from zymotic diseases. The highest relative mortality from acute respiratory diseases occurred in the Hudson Valley district, the next highest being in the Lake Ontario and Western district, in which latter the greatest relative zymotic mortality occurred. Diphtheria has decreased in prevalence since last month in all parts of the State, causing 476 deaths, which is below the average for January. A case of varioloid is reported February 19th from Rochester, the origin of which is not yet traced, the first case occurring outside of the Maritime district for more than a year. The average temperature for the month was slightly below the normal, 23° Fahr., with ranges from—6° to 56°; the precipitation was slightly excessive, and the wind generally westerly with high velocity.

Sixteenth Annual report of the State Board, for the year 1895, comprehends a description of the systems of sewerage and sewage disposals in the villages of Gowanda, Cooperstown, Waverly, Liberty, Westport, Far Rockaway, Mechanicsville, Charlotte, Peckham Manor, Chateaugay, and Hastings-on-the-Hudson, with maps and charts.

Report on Foods and Drugs, by Willis G. Tucker, Ph. D.; and numerous special reports on complaints of various unsanitary conditions.—The director of the laboratory for the Examination of Foods and Drugs appears to have been embarrassed during the year by the need of funds. Nevertheless 1,170 samples of drugs are reported upon and so tabulated as to afford an instructive lesson on frauds and fraudulent dealers—the sources of the samples being given, together with the results of the examination. 43 samples of drinking water were also examined by chemical analyses during the year, with regret by the director that no facilities exist in the laboratory for biological examinations as well, with a view to more

certain results. Report of the Tuberculosis Committee is appended. Except completeness of organization, it gives comparatively little on the progress of this important work, which may be expected to be more fruitful hereafter. The monthly bulletins for the year are appended, giving the ratios of deaths from prevailing diseases in the chief centres of population for each month in the year. As summed up the number of deaths reported for the year was 126,235. 34.2 per cent. was of infants and children under five years of age. The ratio of mortality from zymotic diseases was 17.81 per cent. From consumption about 10 per cent. Estimating the population at 6,650,000, the death rate per 1,000 was 19.

New York City, 1,995,000. Report for January: Deaths. 3,182—1,076 under five years. Death rate, 18.82. Zymotic diseases, per 1,000 from all causes, 188.00; diphtheria, 162; typhoid fever, 19; consumption, 422; acute respiratory diseases, 522; diarrhoeal diseases, 43.—A committee of the County Medical Society, appointed to consider the necessity of taking steps to prevent the spead of pulmonary tuberculosis, has reported a resolution endorsing the action of the Board of Health.

Brooklyn, 1,100,000. Report for January: Deaths, 1,512—517 under five years. Death rate, 16.30. From zymotic diseases, per 1,000, from all causes, 127.00; diphtheria, 105; typhoid fever, 12; consumption, 156; acute respiratory diseases, 278; diarrhoeal diseases, 5.

Buffalo, 350,000. Report for January: Deaths, 432—182 under five years. Death rate, 14.81. From zymotic diseases, per 1,000 deaths, from all causes, 150.50; diphtheria, 49; acute respiratory diseases, 97; consumption, 37; typhoid fever, 2.

Rochester, 170,000. Report for January: Deaths, 200—48 under five years. Death rate, 14.12. From zymotic diseases, per 1,000 deaths, from all causes, 155.00; consumption, 15; acute respiratory diseases, 30; diphtheria, 19.

Albany, 100,000. Report for January: Deaths, 173—38 under five years. Death rate, 20.75. From zymotic diseases, per 1,000 deaths, from all causes, 1,235; typhoid fever, 7; diphtheria, 7; consumption, 32.

We are pleased to observe that the physicians of Albany are at last aroused to the necessity of purifying the water supply.

Syracuse, 100,000. Report for January: Deaths, 127—35 under five years. Death rate, 15.25. From zymotic diseases, per 1,000 deaths, from all causes, 125.00; consumption, 13; acute lung diseases, 24; typhoid fever, 4.

NORTH CAROLINA.—George G. Thomas, M. D., President, Salem; Richard H. Lewis, M. D., Secretary, Raleigh.

January bulletin summarizes reports from 26 towns, with aggregate populations of 84,672 white and 60,363 colored, for the month of December. Deaths, 80 white, 87 colored. Death rates, respectively: 11.3, 17.1, 13.8. The chief causes were: From diarrhoeal diseases, 14; consumption, 29; typhoid fever, 6; malarial fever, 5; pneumonia, 18.

OHIO.—S. P. Wise, M. D., President, Millersburg; C. O. Probst, M. D., Secretary, Columbus.

Cincinnati, 405,000. J. W. Prendergast, M. D., Health Officer, reports for January: 537 deaths—151 under five years of age. Annual death rate, 15.91. From consumption, 81; pneumonia, 67; zymotic dieases, 57.

Toledo, 137,780. J. T. Woods, M. D., Health Officer, reports for February: Deaths, 118—42 under five years of age. Death rate, 10.20. Deaths from consumption, 10; diphtheria, 9; typhoid fever, 1.

Columbus, February 23.—The Columbus "sanitary works," an institution built some months ago to get rid of the city refuse, was ordered to quit dispensing such foul odors or go out of business by the court to-day.

PENNSYLVANIA.—Pemberton Dudley, M. D., President, Philadelphia; Benjamin Lee, M. D., Secretary, Philadelphia.

Philadelphia, 1,188,793. Theodore B. Stulb, Health Officer, reports for four weeks ending February 27: Deaths, 2,129—626 under five years of age. From diphtheria, 120; typhoid fever, 18; consumption, 213; pneumonia, 468.

Pittsburg, 280,000. Report for the four weeks ending February 30: Deaths, 367—118 under five years of age; typhoid fever, 16; consumption, 37; diphtheria, 6. Death rate, 16.71.

Typhoid fever is reported prevalent in Lewistown and New Brighton.

Diphtheria is reported prevalent in Ormsby, Sandy Hill and at Kelly Cross Roads.

RHODE ISLAND.—A. G. Sprague, M. D., President, River Point; Gardner T. Swarts, M. D., Secretary, Providence. Annual report for the year 1894, and of vital statistics for 1893, pp. 642. The report is virtually divided into *three* parts The first is a report in detail of the work of the Board for 1894, summarised from the

Monthly Bulletin, giving the state of the public health for each month throughout the year; and following this the reports from towns. The percentage of mortality by classes was: Zymotic diseases, 222.02; constitutional diseases, 16.06; local diseases, 46.18; developmental diseases, 10.92; violence, etc., 4.82. Deaths from consumption, 774—52 more than for the preceding year and 10.81 per cent. of the deaths from all causes. From diphtheria, 133—24 less than for the preceding year. From typhoid fever, 159—44 more than in 1893. From scarlet fever, 123—70 less than in 1893. From cholera infantum, 496—207 less than in the previous year; and so, too, of other diarrhoeal diseases, 124—35 less than 1893. Water supplies follow, and a special "Report of the Results Obtained with Experimental Filters," by Edmond B. Weston, a report of great practical utility, worthy of the widest circulation. Vital statistics for 1893: Births reported, 10,048; deaths, 7,440; marriages, 3,544. The causes of death are tabulated for nineteen years—1875 to 1893. And the percentage of deaths from classified causes for 40 years—1853 to 1892. The death rate for 1893 was 19.6.

Divorces granted during the year 1893, 301—of 529 applicants. The proportion of divorces granted to the number of marriages during the year, was one to every eleven and eight-tenths: the proportion of applicants was one to every six and seven-tenths.

South Carolina.—Charleston, 65,165—white, 28,870; colored, 36,295. H. B. Horlbeck, M. D., Health Officer, reports for three weeks ending February 20: Deaths, 97—69 colored. Under five years of age, 24. Annual death rate—white, 16.6; colored, 32.9: 25.79.

Tennessee.—J. D. Plunkett, M. D., President, Nashville; J. Berrien Lindsley, M. D., Secretary, Nashville.

The Secretary's bulletin reports: The principal diseases—named in the order of their greater prevalence—in the State for the month of January were la grippe, lung diseases (acute), measles, typhoid fever, consumption, whooping cough, malarial fever, rheumatism, diphtheria, scarlet fever, mumps, chickenpox, croup, and erysipelas.

Memphis Board of Health reports for February: Deaths, 91—47 white and 44 colored. Of these 26 died of general diseases, 13 of nervous diseases, 5 of circulatory diseases, 18 of respiratory diseases, 0 of digestive diseases, 0 of other local diseases, 3 of developmental diseases, and 6 from other causes.

WISCONSIN.—Solon Marks, M. D., President, Milwaukee; U. O. B. Wingate, M. D., Secretary, Milwaukee.

Milwaukee, 260,000: Walter Kempster, M.D., Commissioner of Health, reports for January: Deaths, 368—178 under five years of age. From diphtheria, 18; consumption, 25. Annual death rate, 16.06 per 1,000.

THE PLAGUE.

A Bombay correspondent of the Independance Belge (New York Sun, February 21), says that the worst week since the disease was first announced by the municipality, at the end of September last, was the one from January 3 to 10, with a death rate of 1,638, that is to say, four times as great as the ordinary death rate, when Bombay counted more than 800,000 inhabitants. Now the official figures, 1,638, may well be subject to revision, because the authorities admit that the returns are incomplete. In other words, the figures stand rather under the mark.

Bombay, March 11.—(The latest report at the time of this writing): The total number of cases of bubonic plague in this city, up to date, is 9,032 and there have been 7,546 deaths from that cause. In the whole presidency, to date, there have been 14,856 cases of the plague reported and 12,204 deaths have been recorded.

PROFESSOR VIRCHOW, of Berlin, is reported to have put himself on record as a critic of such blunders as the New York Post Office authorities were guilty of when they received mail matter from Bombay without fumigation.

"In keeping out infectious diseases," he says, "I warn all governments to rely on nothing so much as on police precautions. Fortunately, Germans and Americans have learned a lesson in that respect during the last ten years. The manner in which cholera was held at bay in New York Harbor four years ago was a spectacle for medical gods to be proud of. We Germans have not done half so well in Hamburg.

"Yes, there is a possibility that the plague will visit Europe or America, or both. The only thing that can be done at present to guard against it is to watch the shipping lists. Whenever a vessel that may come from an infected port nears our shores, let the police, reinforced by medical advisers, swoop down upon it and investigate it thoroughly.

"And if a case of sickness occurs, let it be isolated, and isolated in the strictest manner.

"There are, I am sorry to say, in all countries stupid and sentimental people and negligent officers of the law, and these I fear more in connection with infectious disease than the disease itself. Science knows how to grapple with disease, but a few light-headed or mischievous persons have it in their power to undo by a single act the beneficial labors of science and legislation covering a decade."

CHOLERA AMONG RELIEF WORKERS.

Calcutta, Feb. 23.—Cholera has broken out among the people employed on the relief works of the native State of Rewah. In two days 160 deaths have been recorded.

MORTALITY STATISTICS ABROAD FOR THE FOURTH QUARTER, 1896.

Population, total mortality, annual death rate per 1,000, and deaths from scarlatina, typhoid fever, diphtheria and consumption.

London, 4,435,955; 21,467; 19.4; 263; 214; 828; 2,192. Liverpool, 632,512; 3,919; 24.8: 104; 71; 47; ? Manchester, 529,561; 3,141; 23.7; 41; 35; 18; ? Birmingham, 501,241; 2,702; 21.6; 42; 37; 53; ? Leeds, 402,449; 2,066; 20.5; 33; 27; 11; ? Dublin, 349,594; 2,590; 26.3; 66; 61; 16; 273. Sheffield, 347,278; 1,746; 20.1; 32; 27; 19; ? Belfast, 277,354; 1,878; 20.1; 43; 37; 11; 221. Bristol, 230,623; 1,049; 18.2; 11; 5; 9; ? Nottingham, 229,775; 1,240; 21.6; 3; 26; 6; ? Bradford, 228,809; 1,070; 18.7; 6; 9; 2; ? Hull, 220,844; 1,206; 21.8; 25; 15; 13; ? Newcastle, 212,223; 1,045; 19.7; 9; 13; 10; ? Salford, 210,707; 1,134; 21.5; 23; 23; 16; ? Leicester, 198,659; 795; 16.0; 24; 15; 23; ? Portsmouth, 178,639; 749; 16.8; 10; 4; 6; ? Cardiff, 162,699; 821; 20.2; 12; 5; 29; ? Brighton, 120,499; 560; 18.6; 1; 3; 8; ? Norwich, 108,630; 510; 18.8; 2; 4; 6; ? Bruxelles, 518,387; 1,190; 18.5; 6; 40; 7; 312. Amsterdam, 487,772; 2,018; 16.5; 2; —; 50; ? Rotterdam, 276,338; 1,406; 20.4; 7; 5; 27; ? La Hague, 187,845; 823; 17.5; —; 3; 6; ? Paris, 2,424,705; 12,198; 20.1; 20, 56; 86; 2,527. Lyons, 438,077; 2,048; 18.7; 1; 29; 17; 316. Lille, 226,276; 1,130; 20.9; 5; 4; 10; 179. Saint-Etienne, 133,443; 653; 19.6; 2; 7; 1; 90. Le Havre, 119,470; 726; 24.3; —; 10; 3; 160. Reims, 108,943; 583; 21.4: —; 8; 4; 82. Berlin, 1,688,849; 7,388; 17.5; 76; 22; 189; 1,075. Hambourg, 625,552; 2,654; 17.0; 3; 8; 32; 328. Munich, 406,000; 2,451; 24.1; 9; 3; 51; 294. Leipzig, 403,461; 1,907; 18.9; 9; 11; 80; 232. Cologne, 324,000; 1,528; 18.9; 3; 5; 45; 170. Dresden, 334,066; 1,717; 20.6; 18; 4; 33; 225. Francfort, 235,052; 908; 15.5; 2; 5; 9; 151. Magdebourg, 215,872; 1,123; 20.8; 5; 3; 42;

110. Hanovre, 214,922; 931; 17.3; —; 4; 10; 131. Dusseldorf, 179,685; 779; 17.3; 4; 4; 25; 88. Koenigsberg, 173,642;; 1,090; 25.1; 16; 10; 51; 83. Nuremberg, 164,689; 831; 20.2; 3; 2; 20: 125. Chemnitz, 163,562; 1,130; 27.0; 1; 2; 28; 86. Stuttgart, 161,485; 639; 15.8; 2; 4; 19; 75. Altona, 149,608; 664; 17.8; 1; 1; 5; 87. Breme, 143,834; 608; 16.9; 3; —; 14; 97. Stettin, 143,592; 811; 22.6; 5; 10; 31; 110. Elberfeld, 140,716; 587; 16.0; 3; 2; 6; 91. Charlottenburg, 138,931; 586; 16.9; 5; 3; 12; 49. Strasbourg, 136,692; 681; 19.9; 1; 4; 28; 89. Barmen, 128,269; 491; 15.3; 15; 2; 21; 54. Dantzig, 126,141; 704; 22.3; —; 7; 23; 74. Halle, 118,040; 667; 21.8; 1; 6; 43; 62. Brunswick, 116,277; 536; 18.4; 2; 2; 5; 69. Aix-la-Chapelle, 111,279; 610; 21.9; 5; 6; 12; 56. Crefeld, 107,486; 456; 17.0; 1; —; 18; 65. Zurich, 126,497; 514; 16.3; —; 6; 3; 54. Vienne, 1,526,623; 7,949; 20.8; 69; 28; 160; 1,429. Bude-Pesth, 579,275; 3,340; 23.1; 50; 18; 60; 542. Prague et faub, 364,632; 1,791; 19.4; 29; 13; 25; 322. Lemberg, 135,908; 979; 28.8; 40; 17; 31; 172. Gratz, 119,413; 867; 29.0; 8; 7; 9; 159. Brunn, 100,210; 710; 28.3; 20; 4; 23; 116. Copenhague, 333,714; 1,517; 18.1; 12; 5; 21; 257. Stockholm, 267,100; 1,089; 16.3; 13; 3; 8; 160. Gothembourg, 114,512; 437; 15.3; 2; 2; 26; 75. Christiania, 174,717; 745; 17.1; 7; 45; 15; 108. St. Petersbourg, 954,400; 6,523; 27.3; 146; 313; 353; 1,065. Moscou, 753,369; 6,427; 34.1; 153; 146; 209; 884. Varsovie, 553,643; 3,571; 25.8; 315; 40; 98; 348. Odessa, 353,000; 2,790; 31.6; 431; 58; 43; 258. Naples, 542,396; 3,326; 24.5; 1; 35; 10; 262.

For the Second Quarter year:

Marseille, 406,919; 3,213; 31.6; 29; 51; 38; 216. Roubaix, 115,390; 645; 22.4; —; 1; 6; 78. Naples, 539,395; 3,806; 28.2; 6; 31; 18; 307. Palerme, 280,540; 1,643; 23.4; —; 36; 28; 118. Venise, 161,636; 893; 22.1; —; 10; 4; 100. Livourne, 104,484; 494; 18.9; —; 6; 1; 55. Madrid, 482,816; 4,600; 38.1; 26; 141; 51; 528. Madras, 452,518; 4,070; 36.0; —; 1,507; —; ?

For the Third Quarter year: Population, total mortality, annual death rate per 1,000, and deaths from cholera.

Rouen, 111,847; 892; 31.9; 12. Le Caire, 353,188; 5,461; 61.8; 425. Alexandrie, 181,703; 2,615; 52.1; 228. Damiette, 43,502; 364; 33.5; 140. Suez et Ismailia, 12,406; 237; 76.4; 13. Port Said, 10,693; 343; 128.3; 15. Lisbonne, 298,903; 2,040; 27.3; 1. St.-Louis de Potosi, 68,401; 772; 45.1; 2. Bombay, 821,764; 7,477; 36.4; 229. Madras, 452,518; 4,556; 40.3; 52.

BOOK REVIEWS.

TRANSACTIONS OF THE MEDICAL SOCIETY OF NORTH CAROLINA. Forty-third Annual meeting, at Winston-Salem, May, 1896. R. D. Jewett, Wilmington, Secretary.

A pamphlet of one hundred and seventy pages, comprehending a dozen papers of interest to medical practitioners, and the proceedings of the conjoint session with the North Carolina Board of Health.

Dr. R. L. Payne, in his presidential address, forcibly reminded the society of its neglected obligation incurred eighteen years ago in having procured the enactment of a law creating the State Board of Health on such terms as implied the co-operation and assistance of the Society. "Yet the North Carolina Board of Health stands to-day the monument of your neglect. * * * When we contemplate all the far reaching issues involved in the effort to promulgate the great principles of hygiene among our people, the suppression and prevention of death-dealing epidemics and the study of vital statistics and climatology of North Carolina, we could almost believe the angels weep when they look upon the short-sighted policy of our quandom legislators: but none the less the question, 'Have I done my duty to the Board of Health?' is one pregnant with meaning for you and me. Have you ever looked over the Bulletin of the Board of Health and noticed how few physicians make monthly reports to the County Superintendents? That even in the matter of reporting contagious diseases there is such a reluctance on the part of many physicians; they are slow to declare a diagnosis lest they incur the displeasure of their patrons, who are unwilling to submit to the restraints of quarantine. What have you done to educate the public mind as to the necessity of placing contagious diseases under surveillance, and the protection of the public from disastrous epidemics, by the rigid quarantine of all persons liable to diffuse the contagion? What have you done to aid in the gathering of vital statistics; or what have you contributed to the study of our climatology? Most of us would have to answer in reply to these questions, nothing; and yet we fail to realize that in this simple neglect of duty we are also robbing ourselves of patients and fees, for when once the low death rate of North Carolina and her wonderful climate, as we pass from her seashore to her mountain tops, that combines all the advantages of

the plains of Southern France with the mountain heights of Switzerland—when once this wonderful climate and low death rate are understood—we will be the envied people of the world; our waste places will blossom as the rose and our whole State will be flooded with those who seek health in our borders and who will be only too glad in return for the boon to help push on our car of progress. Let us each one resolve to lay aside our apathy in these important matters, and do all in our power to make the Board of Health a potent factor for good in North Carolina, not from any selfish motive, but for the great cause of humanity." In the Conjoint Session, Dr. Geo. G. Thomas, President of the Board of Health, made a general statement of the Board's relations to the profession of the State and to co-operative health organizations generally, to the recent advances in preventive medicine, and urged the particular attention of the Society to the much needed better care of the insane in the State. Dr. Richard H. Lewis, Secretary of the Board, gave a concise statement of the work of the Board during the year passed, with special reference to the prevention of tuberculosis, drinking water in its relation to malarial diseases and instructions on quarantine measures and disinfection in dealing with infectious diseases. Attention is also invited to papers read by members of the Board at the Washington Health Congress—Impurities of Drinking Water, by Dr. F. P. Venable, and Sanitary Drainage and Disposal of Household Waste, by Eng. F. C. Chase—with a view to their publication with the proceedings of the Board for distribution. Some discussion followed the presentations made by the President and Secretary of the Board of Health, encouraging to the hope that this unique feature of the Society—the conjoint session with the Board of Health—so well calculated to promote interest in practical sanitation among the medical practitioners of the State, may prove more fruitful hereafter than it has been hitherto.

TRANSACTIONS OF THE MEDICAL AND CHIRURGICAL FACULTY OF MARYLAND.—Ninety-eighth Session, April, 1896. John S. Fulton, Secretary, Baltimore.

A pamphlet of one hundred and forty pages, containing an excellent report of experiments on "Infant Feeding," by G. E. Gordon, of the Walker-Gordon Laboratory. It deals entirely with milk; gives the results of analyses of mothers' and cows' milk, their varying conditions, relation to digestive disturbances and the reasons for them; and the needful treatment of cows milk in order to render it as nearly as practicable as acceptable and as wholesome to infants as mothers' milk.

PROCEEDINGS OF THE FLORIDA MEDICAL ASSOCIATION.—Twenty-third Session, April, 1896. J. D. Fernandez, M. D., Secretary. Jacksonville. Pamphlet, pp. 127.

"Hygiene in Florida," is the subject of an address by Dr. Geo. Troop Maxwell, of Jacksonville. He briefly refers to the prevalence of malarial diseases and their continuance in default of soil drainage, the progress of bacteriological knowledge as the handmaid of practical sanitation, the pollution of the soil and the common neglect—and nowhere more than in Florida—of house drainage and sewerage. He refers, with some emphasis—but less than he might have done with the experience of practical observers to sustain him—to the unsustained opinions of some officials who would advertise their officiousness in the wrong direction in dealing with yellow fever as a contagious disease, instead of dealing with the chronic *infectable conditions* to which such officials are purblind. "The Hygiene of Surgery," by Dr. J. V. Harris, of Key West, is a brief but important paper, giving the gist of—and the credit to—applied sanitation in surgical and obstetrical practice. There are half a dozen other papers, all of importance more or less to practitioners of curative medicine.

ANNUAL OF THE UNIVERSAL MEDICAL SCIENCES AND ANALYTICAL INDEX.—A yearly Report of the Progress of the General Sanitary Sciences throughout the World. Edited by Charles E. Sajous, M. D., Paris, and Seventy Associate Editors. Assisted by over two hundred Corresponding Editors, Collaborators and Correspondents. Illustrated with Chromo-Lithographs, Engravings and Maps. Five volumes, 8vo., 1896. The F. A. Davis Company, Publishers: Philadelphia, New York, Chicago.

To test the completeness and wealth of this work as a descriptive record of progress, one has but to look in the index for any new subject that has attracted his attention during the year. Applying this test, with the aid of several reference lists at hand, we have not failed in a single instance. Moreover, the plan of the work has kept pace with its purpose—it is progressive. In this issue—"*c. g.*, to afford greater aid to the general practitioner and to enable investigators and authors to find in its pages not only food for thought, but also a greater number of utilized facts * * * each associate editor has been privileged to so modify, omit or add to any thing falling under his purview as to bring out the most important features of the subject in question"—a feature of improve-

ment which can be the better appreciated when considered in relation with the quality of the associate editors; men, without exception, recognized as authorities in their several departments. Among the smaller items of improvement on preceding issues, are ennumerated the following: 1. Headings and side-headings are presented in large black letters, instead of the small capitals and italics formerly used. 2. All prescriptions are written out in full and in the usual form, instead of being run in as heretofore. 3. All therapeutic subjects have been collected in one—the fifth—volume so as to be more readily available as a reference book. 4. Increase in the number of colored plates.

CONTEMPORARY LITERATURE.

THE REVIEW OF REVIEWS editorial comments in the March number on the Spanish programme of reforms in Cuba, the United States Senate's attitude toward the arbitration treaty with England, the immigration bill, the proposed international monetary conference President-elect McKinley's cabinet selections, the recent Senatorial elections, the New York Trust investigation, the famine situation in India, the affair of the Greeks in Crete, the foreign policy of Russia, the position of England, France, and the other great powers, and many other matters are of current interest.

LOSSES IN THE WAR.

General Horace Porter, in his "Campaigning With Grant," in "The Century," carries the narrative in the March number through the Cold Harbor campaign. General Porter says: "While at the mess-table taking our last meal before starting upon the march to the James on the evening of the 12th, the conversation turned upon the losses which had occurred and the reinforcements which had been received up to that time. The figures then known did not differ much from those contained in the accurate official reports afterwards compiled. From the opening of the campaign, May 4, to the movement across the James, June 12, the total casualties in the Army of the Potomac, including Sheridan's cavalry and Burnside's command, had been, killed 7,621; wounded 38,339; captured or missing 8,966; total 54,926. The services of all the men included in these figures were not, however, permanently lost to the

army. A number of them were prisoners who were afterward exchanged, and many had been only slightly wounded, and were soon ready for duty again. Some were doubtless counted more than once, as a soldier who was wounded in a battle twice, and afterward killed, may have been counted three times in making up the list of casualties, whereas the army had really lost but one man.

"The losses of the enemy have never been ascertained. No precise information on the subject has been discovered, and not even a general statement can be made of his casualties. In a few of the battles of this campaign his losses were greater than the losses suffered by the Union troops; in the greater part of the battles they were less. Our reinforcements had amounted to just about the same number as the losses. It was estimated from the best sources of information that Lee had also received reinforcements equal to his losses, so that the armies were now of about the same size as when the campaign began.

"All the reinforcements organized in the North and reported as on their way to the front did not reach us. There was a good deal of truth in the remark reported to have been made by Mr. Lincoln: 'We get a large body of reinforcements together, and start them to the front; but after deducting the sick, the deserters, the stragglers, and the discharged, the numbers seriously diminish by the time they reach their destination. It's like trying to shovel fleas across a barnyard; you don't get 'em all there.' "

DISEASE-BEARING PARASITES.

Texas fever, an infectious disease of cattle which prevails as an endemic disease in certain regions in the southern portion of the United States, has been shown, by the researches of Theobald Smith and other bacteriologists belonging to the Agricultural Department, to be due to a blood parasite belonging to the protozoa (*Pyrosoma bigeminum* of Smith). In this disease the tick has been shown to be the intermediate host of the parasite. The ticks which fall from infected animals give birth to a numerous progeny in the pastures frequented by them, and these young ticks attach themselves to other animals which subsequently feed in the same pastures and transmit to them the fatal infection.

The tsetse fly disease of Africa has recently been shown by the researches of Bruce to be due to a flagellate infusorium which is found in the blood of infected animals. This disease is fatal to the ox, the horse, the dog, the sheep, and the ass, but not to the indigenous wild animals in the region infested by the tsetse fly.

The researches of Bruce indicate that the fly acts as a carrier of the parasite from diseased to healthy animals. He has shown by experiment that after feeding on the blood of an infected animal the tsetse fly can communicate the disease to a healthy animal by its bite. After a short period of incubation the haematozoa appear in the blood concurrently with the development of fever, and followed by rapidly progressive anaemia, dropsy, and death.

The so-called "surra disease," which prevails in certain portions of India, is believed to be due to a similar parasitic protozoan (*Trypanosma Evansi*). According to Lingard, this infusorium exists as an innocuous parasite in the blood of rats in India. It is not pathogenic, or only feebly so, for the native ox of India, but gives rise to a fatal infectious disease in horses, dogs, and camels.—From "The Malarial Parasite," by Surgeon-General Sternberg, in "Appleton's Popular Science Monthly" for March.

HOW INDIANS ARE NAMED.

As the Indian child grows he commits acts from time to time, each of which gives him a new name. For example, he may see a bear and run screaming to the tepee. The folks all laugh at him, and call him Runs-from-a-bear. Later on he may become the possessor of an unruly pony which he fears to ride, and becomes known as Afraid-of-his-horse. Or, he may mount a horse from which another Indian has been thrown, and he then is spoken of as Rides-the-horse. Further on he becomes a great hunter and kills five bears, and they call him Five-bears, and when he slays another his name changes to Six-bears. He may perform a valiant deed in battle and ride his horse through the camp of the enemy, for which he is dubbed Charges-through-the-camp. During the conflict he may kill one of the enemy. If his victim is the only one slain he is called Kills-the-enemy. But if others fall the one he has killed must be described, as Kills-the-one-with-the-big-knee. If he braids in his hair a yellow feather which he has plucked from the tail of an eagle he may be called Eagle-tail, Eagle-feather, Yellow-tail or Yellow-feather. If he gives it to his friend he will be named Gives-feather, but if he refuses to part with it his name will change to Keeps-his-feather. Or he may obtain his name from some other object. If he is accustomed to ride what is commonly known as a "calico" horse he may be called Spotted-horse, but if his horse has a short tail he will be known as Bob-tail-horse. The chances are that he will be known by all the foregoing names. His enemies in the tribe will continue to speak of him as Long-ears, Runs-from-a-

bear, or Afraid-of-his-horse, while his friends will call him Rides-the-horse, Six-bears, or Kills-the-enemy. For this reason it occurs that if you speak of the Indian in the presence of certain members of the tribe and call him Six-bears they will laugh at you and say: "That not his name; his name Runs-from-a-bear." But if you speak of him to certain others as Runs-from-a-bear they will scowl and say: "That not his name; his name Kills-the-enemy."

Hence it will be seen that the Indian names are nothing, a delusion and a snare, and the practice of converting them into English appears eminently unwise. It is certain that the name on the rolls at the agency is the interpretation of only one of the Indian's several "names." A short Indian name in their own vernacular, or a syllable or two of a long one, if euphonious and pronounceable, as they usually are, will answer quite well for a family name, but the translations are never satisfactory, and cannot be too strongly condemned.—From "Naming the Indians," by Frank Terry, in March Review of Reviews.

PRINCIPLES OF PUBLIC AND PRIVATE CHARITY.

One thing must still be demanded on both sides of the Atlantic: the respective provinces of public poor relief and of private charities must be defined as clearly and as carefully as possible; furthermore there must be established between the two a definite and well-ordered relation. This is recognized, in Germany, as the aim and the goal of relief work. To begin at the two extremes one might say: Essentials, necessaries of life, are to be supplied by public charity, while the furnishing of useful or unnecessary things, or even luxuries, shall remain the province of private charities. How much shall be included in the "essentials" must, of course, depend upon circumstances.

To decide further than this what particular work shall be done by public relief and what left to private charities, will always remain a very difficult matter. In other words; poor relief must become *the social science;* its proper exercise can be understood only by a comparative study of economic and social life. We know that no social effort can or will succeed in making poor relief and philanthropy superfluous, within such a time as lies open to our present vision. But relief work would no doubt be performed far more thoroughly and more intelligently if those engaged in it know and realize that their work is to be for others, not for themselves. The essence of poor relief is not the gratification of one's self-esteem by giving alms, but the complete resignation, sacrifice of self in the

service of others.—Dr. E. Muensterberg, of Berlin, in "The American Journal of Sociology" for March, University of Chicago Press.

LITERARY NOTE FROM THE CENTURY CO.

A first prize of $500 and a number of smaller prizes have been offered by The Century Co., publishers of The Century Dictionary and Cyclopedia, for the best answers to a hundred and fifty questions covering a broad range of information.

A sample question, which is easier than some of them, is as follows: "What is the approximate difference in altitude between the loftiest Alpine summit and the bed of the greatest depression in the Mediterranean basin?"

An additional prize of $500 is offered to any one who can answer 90 per cent. of the questions from any ten published works of reference other than The Century Dictionary and Cyclopedia.

THE TENNESSEE EXPOSITION.

BROOKLYN COMMISSION.

Mayor WURSTER has appointed the following Commissioners to represent the City of Brooklyn at the Tennessee Centennial Exposition, which will be held in Nashville, beginning on May 1st, and lasting for six months:

Col. William Hester,
William M. Van Anden,
Hon. Charles A. Schieren,
Hon. William Berri,
Hon. George A. Price,
Charles A. Moore,
Hon. William C. Wallace,
F. S. Sherry,
Daniel T. Wilson,
Hon. A. D. Baird,
Robert P. Lethbridge,
J. Henry Dick,
Ernestus Gulick,
Thomas P. Peters,
Hon. Richard Young,
William C. Redfield,
William Vogel,
Herbert L. Bridgman,
Dr. A. N. Bell,
C. C. Broun,
William C. Pate,
George P. Jacobs,
A. H. Angell,
F. M. Munroe,
Hon. James A. Sperry,
W. H. Baldwin, Jr.,
A. W. Higgins,
Hon. Ludwig Nissen,
A. E. Palmer,
Charles E. Wheeler,
Hon. John D. Keiley,
Hon. A. Van Wyck,
Abraham Abraham,
Hon. H. B. Scharmann,
James McKeen.

CONGRESS OF AMERICAN PHYSICIANS AND SURGEONS.

Will be held in WASHINGTON, D. C., MAY 4th-6th, 1897.

President, WILLIAM H. WELCH, M. D., LL. D., Baltimore, Md.

The Association societies represented are as follows:

American Otological Society, President, Dr. Arthur Mathewson, Brooklyn, N. Y.

American Neurological Association, President, Dr. M. Allen Starr, New York City.

American Gynecological Society, President, Dr. J. R. Chadwick, Boston, Mass.

American Dermatological Association, President, Dr. J. C. White, Boston, Mass.

American Laryngological Association, President, Dr. C. H. Knight, New York City.

American Climatological Association, President, Dr. E. F. Ingals, Chicago, Ill.

Association of American Physicians, President, Dr. J. M. DaCosta, Philadelphia, Pa.

American Association of Genito-Urinary Surgeons, President, Dr. F. S. Watson, Boston, Mass.

American Orthopedic Association, President, Dr. Samuel Ketch, New York City.

American Physiological Society, President, Dr. Russell H. Chittenden, New Haven, Conn.

Association of American Anatomists, President, Dr. Frank Baker, Washington, D. C.

American Pediatric Society, President, Dr. S. S. Adams, Washington, D. C.

American Surgical Association, President, Dr. J. C. Warren, Boston, Mass.

American Opthalmological Society, President, Dr. G. C. Harlan, Philadelphia, Pa.

Chairman of the Executive Committee, Landon Carter Gray, M. D., New York City.

Treasurer, Newton M. Shaffer, M. D., New York City.

Secretary, William H. Carmalt, M. D., New Haven, Conn.

THE SANITARIAN.

MAY, 1897.

NUMBER 330.

DANGERS OF SANITARY NEGLECT AT THE WATER-SHEDS FROM WHICH COME SUPPLIES OF CITY WATER.*

BY PROF. W. P. MASON, OF RENSSELAER POLYTECHNIC INSTITUTE, TROY, N. Y.

Everybody is talking or writing about water, but the public is far from being well posted. Ocular evidence of purity is popularly sufficient. The bright and limpid water from the well which drains a graveyard is quite satisfactory to those who would shudder over a cholera ship's touching at our most distant port. The $5,000 just voted at Albany, N. Y., for studying the bubonic plague were better expended toward getting a pure water supply for that city.

A letter written me says: "Water taken midway between the surface and bottom of a river will always be found as pure as fresh spring water. Impurities on the surface will be blown ashore in a few hours, while those heavier than the water will sink to the bottom."

Highly desirable as it would be to keep the waters of our great rivers in potable purity, the enormous expense would be prohibitory, apart from considerations of great injustice to established institutions. Large centers of population now in existence turn their sewage directly into the river on whose banks they stand, and an up-stream city might well complain should it be forced at great expense to establish sewage disposal plants when the town below for much less money could secure purer water from some inland source.

A land should be looked upon as watered by its smaller lakes, its springs and brooks, and sewered by its great streams, especially

*Abstract of a recent lecture before the Franklin Institute, Philadelphia.

by its navigable rivers. Its water sources should be protected by law with exceeding care, and no river or stream should be added to its list of drains except after proper consideration by a State Board of Health, followed by legislative permission.

The typhoid fever outbreak at Plymouth, Penn., showed the direct relation between epidemic disease and a polluted water supply. It was traced to a single typhoid patient whose dejecta were thrown out upon the snow upon a hillside at whose base ran the stream supplying the town. The dejecta were frozen solid for weeks; but the March thaws dissolved and carried them into the stream below. Pruden long since showed that typhoid bacilli can survive three months' continuous freezing; while a more recent authority finds germ life standing the temperature of liquid oxygen, 298 degrees below zero, Fahrenheit.

The Massachusetts State Board of Health by a series of experiments at Lawrence, has determined that through intermittent filtration with beds of gravel or sand city sewage may be converted into potable water.

On many a farm and within the limits of many a town, human dejecta are disposed of in a vault or cesspool, and the purifying power of the earth depended upon to prevent pollution of the family well, or of the adjacent stream. The distance from cesspool to well is often so short that the intervening soil has not the capacity to eliminate the amount of filth present, even by a process which must be essentially a continuous rather than an intermittent form of filtration. An elaborate series of analyses of the earth in the immediate vicinity of a cesspool showed that pollution extended to at least fifty feet from the cesspool.

In New York State the occurrence of typhoid fever cases in country, as compared with city, have been in the ratio of 33 to 24.

The average annual death-rates for thirteen Massachusetts cities stand, before introduction of public water supply, 79.04 per 100,000; after such introduction, 38.03. For the whole State of Connecticut, the percentage of typhoid deaths to total deaths had fallen from 5.08 in 1870 to 1.84 in 1893. Such figures show the advantage of selecting water supplies over the general run of those derived from the domestic well.

PROPER CARE OF WATERSHEDS.

The proper care of the watershed is as necessary as it is unusual. Such care should extend even to protecting the ground

water for a considerable distance before it enters the feeding brooks of a district.

The larger cities of our country construct aqueducts, conveying the water from collecting to distributing point, under circumstances usually precluding the introduction of sewage material. Such handling is not universal—open channelways are quite commonly seen; and care is not always taken to prevent pollution during the water's flow.

The cholera epidemic at Messina, Sicily, in 1887, lasted from September 10 to October 25, totaling 5,000 cases and 2,200 deaths. The government instituted an examination of the water supply. It left the mountain gathering grounds of excellent quality, but was conveyed to the city in an open conduit, and favoring the Messina washerwomen, who wash outdoors, a portion of the public water was deflected before reaching the wells and taken into neighboring wash pools. A very fair proportion, after having cleansed the soiled linen of the inhabitants, found its way back again into the conduit, and continued its course to the city. Further contamination occurred in the city, the mains being of unglazed tiles, very leaky, with the sewers running frequently atop of the water mains. The government sent tank ships to the mains, filled them with pure water, the people drank thereof, the cholera cases fell immediately from seventy to five. An entirely new and efficient distributive system has since been introduced, and the city has escaped further cholera visitation.

ORIGIN OF TYPHOID FEVER.

Two conceptions of the origin of typhoid fever are held by opposing schools of bacteriologists: That the typhoid germ is always the offspring of a bacillus of its own kind; the other, that the progenitor in question is often a saprophyte, which takes on its pathogenic properties by cultivation through successive generations under favorable conditions. Army officers view with favor the theory of the saprophytic origin from some germs in the soil. The presence of filth and the production of disease are very closely related.

The public at large have an abiding faith in the efficiency of self-purification of running streams beyond the ability of science to remove. The bacterium does not suffer in efficiency even though the oxygen be reduced greatly below the normal supply. Sedimentation plays a part in general purification during open flow; but it is only a small one.

The sum total of self-purification occurring during the flow of an open stream is so insufficient as to permit of the carriage of infection for many miles toward the sea.

In drawing a water supply from a large lake, sedimentation becomes of prime importance, as the element of time enters very largely into these cases. Sedimentary deposits of polluting materials should not be disturbed after settlement, for they may retain their objectionable properties long after they have separated from the water levels above them.

In lakes the surface water cools down in autumn, and toward the verge of winter a temperature would be attained increasing its gravity beyond that of the lower layer on which it floated. When this point is reached vertical circulation is established and the lake turned over. With the advent of freezing weather a second stratification would ensue. The warm sun of April would inaugurate a summer stagnation again. It is advisable to avoid drawing the supply from a stagnant layer, especially with the same resting upon a dirty bottom. Clean water, stored in clean reservoirs, must form layers, of course; but the bottom portions may be used as freely as those nearer the surface. When the periodical turnover takes place, the water which has rested upon a dirty bottom starts upon its forward course, diffusing throughout the entire lake materials it has received during its rest. Much plant food is distributed through the upper waters, and the growth and decay of these waters cause the unpleasant taste so often met with in our city supplies.

CLEANING OF STORAGE PONDS.

The cleaning of storage ponds, it has been said, is all a mistake, and that it would be far better to leave the vegetable debris and add to the accumulation rather than diminish it. Comparative experiments upon reservoirs have shown, however, that improved water unquestionably follows cleaning; and it must be remembered that while good water may be obtained from swamp sources, where vigorous growth disposes of the products of decay, beyond question the reverse obtains under conditions permitting the products of decomposition to accumulate. The bottom of a prepared reservoir should be cleaned of all varieties of vegetable matter. Decomposition of recently killed vegetation takes place quite rapidly at first under water, but afterward proceeds with great slowness.

A reservoir with gently sloping sides furnishes favorable conditions for contaminated water supply. Such sides permit thin lay-

ers of water to be overheated by the summer's sun, thus favoring the growth of aquatic and land plants, which subsequently decay and damage the water.

Great trouble with the water supply (New York and Croton supply line) arose at Purdy Station from the fact that they had not disposed of the grass of the farms covered with water. They removed the trees, but did not remove the stumps or plow the grass lands, and when the latter were flooded and again exposed the stench was so tremendous that it nearly drove the Purdyites out of town.

Waters from underground sources should be distributed as soon as possible after being brought to the surface. As they are commonly well supplied with plant food in solution and under the influence of light and air, there is danger of the development of algae if much exposure to these elements be allowed.

Sedimentation—suspended impurities—is of two sources, one arising from the impounding of surface water. Bacteria die slowly, and although a large percentage will disappear through storage, they are very long in settling, so that it should not be expected that a reservoir could do the work that could be accomplished by a filter.

With reference to the influence of precipitating mud—if the water be roily—let us take one roily and one not, but each containing the same number of bacteria per cubic centimeter. The one that is roily or muddy will, during the same length of storage, improve the more so far as its bacterial contents are concerned. The precipitated mud acts as a carrier of these bacteria and drags them down as it falls.

I have seen water pipes in direct contact with sewage, and in one instance the main of a large city street actually cut through the sewer. Fears are allayed by the argument that the pressure of water in the pipe would surely cause a flow outward, not inward, in the event of a rupture. With the operation of the Richards pump before us (depending on the power of rapidly moving water to suck air in through a side tube), the promise is that should such rupture occur the result might be most unhappy.

WATER SHOULD BE FILTERED.

It is the common American practice to deliver water raw to the consumer. Even when its purity is unquestioned, such is not the European custom; public sentiment practically demands that surface waters should receive sufficient purification before distribution for domestic uses. In Germany this matter is regulated by statu-

tory law. Filters are established to filter waters equal in natural purity to the best supplies America can show.

Americans of Albany, Pittsburg, or Chicago scrutinize the water offered them in foreign capitals, when what they are habituated to drink at home would not be tolerated in the great cities of Europe. The day is past when we can feel a sense of superiority over the Old World because of the magnitude and consequent initial superiority of our sources of water supply. Europe has lately expended much to better her water supplies, while we have forgotten that our populations and industries have been growing, and that the rivers our fathers drank from with safety have become charged with the refuse of up-stream communities.

To abandon an existing water-supply system, or to purify a polluted water, always involves the outlay of much money, and the taxpayer has the right to inquire whether the cash is fairly expended. No better measure can be furnished of the wholesomeness of a water supply than the actual list of typhoid fever cases in the community supplied. The means of prevention in the shape of great public works are expensive, and the question is asked: Do these works pay? Can we afford to save the typhoid victims?

According to Rochard the economic value of an individual is what he has cost his family, the community, or the State for his living, development and education. It is the loan which the individual has made him by his relatives and the State in order to reach the age when he can restore it by his labor. Chadwick considers an English laborer equivalent to a permanent deposit of $980; Farr gives $780 as the average value of each human life in England. The French soldier is rated at $1,200. In view of the fact that typhoid fever selects by far the greatest number of its victims from among those in the very prime of life, to the relative exclusion of the very young and the very old, it will be reasonable to place the loss caused the community by a death from typhoid fever at $2,000. This is less than half the figure so frequently referred to in the courts of New York State as the value of a human life.

COST OF TYPHOID FEVER.

The average annual typhoid fever deaths in Philadelphia from 1890 to 1894 was 523, which, at $2,000, would mean an annual loss to Philadelphia of $1,046,000. Funeral expenses are estimated at $26 to $30. Should we accept $25, this would cost $13,075, thus raising the total direct loss through death to $1,059,075. But typhoid fever does not always kill. The percentage of recoveries

varies in different places different years. The Montreal rate for eleven years is about 11.02 per cent., with sundry other places as high as 19 plus, and in other years 6 plus; but call the recoveries 10 per cent. Should we estimate nine recoveries to each death from the disease, and place forty-three days as the period of convalescence—the period during which a man is not receiving any wages —we should have to add to the 523 deaths from typhoid fever in your hospitals here in Philadelphia a term of 202,401 days as representing the time lost per year by the 4,707 persons who have the fever and recover. Thus, an annual loss of over 554 years has to be borne by the city's capital of productive labor. This, translated into the money value, should be added to the death loss.. Fixing the wages at $1 per individual per day—which is a very low figure —there is a loss of $43 of wages for each recovery, or a total yearly loss for the city from this item of $202,401. Nursing and doctors' bills equal at least $25 per case, adding, further, $130,750. Expressed in tabular form, this yearly tax imposed by typhoid fever would stand:

Deaths, 523, at $2,000 each	$1,046,000
Funerals, 523	13,075
Wages of 4,704 convalescents during forty-three days	202,401
Nursing and doctors' bills of 5,230 cases at $25	130,750
Total annual tax levied by typhoid fever upon the City of Philadelphia	$1,392,226

Public works which would eliminate a reasonable fraction of this great tax would certainly pay for themselves in the course of a few years, even though they were expensive.

Suppose the trolley system was so badly managed that 523 human lives were crushed out annually and some 4,704 other persons were more or less seriously injured, do you suppose the people of Philadelphia would tolerate such a state of affairs, or would grudge the necessary amount of money to stop such carnage? Surely not! Yet they are submitting to just such an amount of loss; only that it comes in a way less shocking. There is no community but can well afford to introduce a filtration system, however costly, rather than longer incur the risk of typhoid fever that must inevitably result without improvement.

Certain suits are now pending in the West to recover for loss of life by typhoid fever contracted by impure water, where it is shown that the public water is seriously polluted by sewage, and therefore

an active source of disease. Fancy what would ensue if these cases were decided favorably! Cheap water may be at times a poor investment; and such would be the decision of the Water Commissioners of various communities in the event of damage awards for typhoid fever deaths.

Water coming from a great altitude, giving it great head or pressure, has been sprayed from the feed pipe into the reservoir so as to thoroughly oxygenate it.

EFFECTS OF CONTAMINATED WATER.

The River Tees, seventy miles long, in the northern part of England, runs through towns with plenty of opportunity for contamination. There are hundreds of outhouses discharging into the river underneath, and during dry weather there is quite an accumulation of it running down through a number of towns. About 280,000 people drink that water at the different stations all the way down, while about the same population do not, being situated (though in the same sanitary district) so as to take their water supply from other sources—making a pretty good chance for comparison. The Tees is subject to sudden floods, and during a flood, preceded by a heavy rain, that material is all washed down stream and goes into the intakes below. Every heavy rain produces typhoid fever—a marked increase in the rate—among the Tees water drinkers, while their fellow-townpeople, drinking from other supplies, have no typhoid fever increase amounting to anything.

You say: "How did our forefathers get along without these sanitary arrangements?" A chart of the death rate of London from the beginning of the seventeenth century to date shows, among other things, that from 1660 to 1679 the death rate was 80; in 1888 it was 18.

There is an intake for the Schenectady water supply from the Upper Hudson, above the junction with the Mohawk; West Troy takes Mohawk water; Lansingburg takes its supply from the hills; Troy takes Hudson water above the Mohawk; Albany, right on a hill, cuts a hole in its wharf and gets not only up-stream sewage, but its own. Typhoid fever broke out and started down the Mohawk. Every town that took Mohawk water or Hudson River water after the Mohawk joined it had typhoid; but every town which took Hudson River water above the junction of the Mohawk or got its water from other, entirely different sources, had no typhoid.

London filters every drop of water it uses, with the exception of a small amount that comes from wells. Its sand filters are underdrained by tiling. The water goes through coarse stone, then through gravel, then coarse sand, with a deep layer of fine sand. The sand, roughly speaking, is about the size of mortar sand. The water comes through and leaves its deposit on the upper layer, the sediment being removed with short shovels. After the amount of accumulated material has become so great that the water will no longer go through at the proper rate of speed, they put a gang of men on it and lift that dirt with short shovels. The first can almost be rolled up like a blanket. Its texture is firm; it is bound together by a gelatinous material deposited there by the bacterial agency.

THE WAR WITH THE MICROBES.*

BY DR. E. A. DE SCHWEINITZ.

The work of Pasteur threw light upon the origin of these poisons. As the ferment causes the alteration in the grape juice, so does a microscopic form of life bring about the changes which take place in dead animal and vegetable matter, and also these conditions in the living body which we call disease.

Many of these microscopic forms of single-celled plants, the bacteria, have their natural habitat upon dead organic matter; but they may flourish in the living body, and are almost unlimited in variety, appearance and behavior. It is possible also to cultivate them upon specially prepared solutions after their individual peculiarities have been studied. Some thrive best in light, others in darkness; some like a goodly supply of oxygen, others prefer nitrogen; some are very sensitive to changes of temperature, whil others readily accustom themselves to vicissitudes.

These different bacteria, further, are somewhat eccentric within as well as without the animal body. Some, as the diphtheria germs, find their most comfortable habitat upon certain mucous membranes, others in the lungs, some in the digestive tract, still others in the blood, while others again confine themselves to certain external cells and membranes. In their artificial cultivation this is equally true. While nearly all thrive upon a beef broth, some prefer the beef broth with an excess of acid, others with an

*Abstract of Presidential Address before the Chemical Society of Washington, March 15, 1897.

excess of alkali. Some demand the addition of sugar or glycerine, others the addition of sugar together with acid, while some are satisfied with a diet of phosphates, salt and water.

It remained for Salmon and his assistants in this city to demonstrate, in 1882, that the poisons of germs could be used by men and animals to fortify themselves against the attacks of these same bacteria. This could be accomplished by introducing into the circulation of the animal a small quantity of the poison of the germ, so that when the germ itself was injected the poison which it produced was without effect. What had been found true for one disease of animals proved also to be true for many others, and chemical vaccination was tried for diphtheria, tetanus, anthrax, cholera, typhoid fever, tuberculosis, glanders, and a number of other diseases. But this discovery led to another important and far-reaching. Fodor showed that the blood serum of animals made immune to a particular disease by injecting the animal with the poison which the germ formed had the effect of destroying the germ of the disease. This excited renewed interest in the study of the blood, and within a few years it was demonstrated by the work of many, some in this city in the laboratories before mentioned, that this serum from previously immunized animals not only had the property of conferring immunity upon other animals, but also of checking the disease after it had once begun. How thoroughly this fact was demonstrated, first by Behring and subsequently by Roux and others, in connection with diphtheria and tetanus, has been dwelt upon often, and we know of the many thousands of lives that have been saved by the antitoxin serums.

To prepare these the solution of the toxins which we have before described are injected into different animals, preferably horses, and at the end of six to twelve weeks the blood of these animals is found to yield a serum containing substances possessing both immunizing and curative properties which we call antitoxins. The active principle of this serum present is comparatively small in quantity, but its influence is enormous. It does not appear to be a substance which directly chemically neutralizes the poison, but counteracts its effects within the animal in some unknown way.

It is not only for protection against the two diseases, tetanus and diphtheria, that antitoxic serums can be prepared. Recent investigations have proved that typhoid fever, cholera, anthrax, the plague, etc., are amenable to similar treatment, and in the same department in this city that chemical vaccination received its first

impetus, but by other workers, it has been demonstrated that the two diseases that cause such losses to the farmers of the country may be controlled by antitoxic serum treatment. Investigators in this same laboratory have shown also that a substance antitoxic to tuberculosis can be produced in the serum of animals, when they are properly treated, which has undoubted and pronounced effect in checking experimental tuberculosis in small animals. When we inquire, however, the character of these antitoxins we are almost as yet more in the dark than in our efforts to discover the exact nature of the poison germs. However, it has been possible to separate in a fairly pure form the antitoxic principle from diphtheria serum, a minute amount of which will confer immunity, and the antitoxic principle of swine plague, .002 g. of which has been found to cure animals weighing one pound, and even a solid antitoxic-like substance for tuberculosis has been obtained in an impure form. All these solid antitoxic principles resemble each other very closely in their chemical tests and methods of separation, showing albuminoid reaction, but in their curative properties they are totally independent the one of the other. The difficulty of separating these antitoxins completely from the other constituents of the blood has made it impossible as yet to obtain positive information as to their true chemical character. As to their action: One theory is that they directly neutralize the poison which the germ produced, but this does not seem to be substantiated by experiment.

The diphtheria antitoxic serum does not cure tetanus, the swine plague serum does not cure the cholera. In the case of the venom of serpents it has been found, too, that repeated injections will make the serum of an animal antitoxic and curative against other venoms. The antitoxic serum, too, produced by the cobra venom will protect against the bite of the rattlesnake. It would seem from this that there is a very close relationship between the poisons of venomous snakes, and that immunity to one also gives protection from the other. It seems very probable also that the poisons of ~~germs belonging to different~~ germs will be closely allied, and that an antitoxin for one will also be an antitoxin for the other. In fact, it has been demonstrated that the products of the *coli communis* will protect animals from the typhoid germ, to which it is closely allied. The same will probably be found true with many other diseases where the germs are related.

When milk and cream are first collected they are almost free from germs, but exposed to the air they soon become filled with

those forms of life which are perfectly harmless. If placed under suitable conditions with regard to temperature, they will multiply very readily and the milk becomes sour, due to the formation of lactic acid produced from the sugar in the milk by one or more of these germs. If the germs present happen to be those giving an ether and ester which have a pleasant flavor and aroma, good butter results; but if they give rise to the formation of disagreeable thio-ethers and esters or some amines the butter is poor and bad.

Now, by isolating different germs found in the milk, and cultivating them separately so as to discover their own peculiar product, it is possible to always make butter of the same sort and flavor by first destroying the other germs present by Pasteurization and then inoculating the cream with the particular germ desired. A number of germs have been isolated from milk which will produce good butter, and any one of them is perhaps as good as the other, the ethereal product being slightly different and more palatable to different individuals. Of course, a great many germs have been found which produced disagreeable compounds, and it is not possible to tell from their appearance simply which is a desirable plant, but it is easy to cultivate them in milk and note the results, and select the desirable plant cell.

Fortunately, or unfortunately, the use of these germs has been patented, so that in the near future we may see branded upon particularly fine butters and cheese, "patented in 1893, amended 1896, reissued 1908," etc. May we expect soon a patented process for breathing, eating and sleeping?

Recently it has been found, too, that malt, if inoculated with a particular germ from the skin of the grape, will be converted into wine, and it is certainly not beyond the limits of possibilities that in the future American beer, after a voyage to France, may return as champagne.

The flavor of many luscious fruits and foods is due to the products, either directly or indirectly, of one or more of these useful plant cells. But it is not only in simple industrial processes that the products of germs are important. Man's very existence, while menaced on the one hand by a few germs, is on the other dependent upon their activity. The germs which in the soil produce nitrous and nitric acid and ammonia and aid their assimilation by the plants which facilitate the decomposition of phosphates and bring the phosphorus, a so necessary constituent for the life of plants and animals, into an assimilable form, and aid in the destruction of dead

vegetable matter, play an important but little appreciated part in the continuance of the life and well-being of man, and, on the other hand, what rôle these similar germs play in the formation of poisonous alkaloids has not been thoroughly learned. When we find, too, a germ (as has been noted recently) that can convert starch into cellulose, we are almost led to wonder if it might not be possible to produce cotton in a flask if the particular germs were supplied with nutritious food and a sufficient amount of carbon dioxide, oxygen and water.

We might spend months in speaking of the many other ways in which the products of the dreaded bacteria are useful to mankind, and note those which yield exceedingly brilliant dyes, some of which may be made practically useful. But these and many other germs are only waiting man's bidding to become valuable subjects and to show that, as has been instanced in the history of nations, conquered people often make the best and wisest citizens.

THE BUBONIC PLAGUE GERM.

E. H. Wilson, M. D., Chief Bacteriologist, Department of Health, Brooklyn, reports as follows:

Brooklyn, March 10, 1897.

Hon. Z. Taylor Emery, M. D., Commissioner of Health:

Dear Sir—I have the honor to submit the following report on the influence of certain physical agents on the viability of the bacillus of the bubonic plague (bacillus pestis bubonicas). In 1892, while associated with Gen. Sternberg, I assisted in a series of experiments calculated to show the effects of sunlight, desiccation, moist and dry heat on the spirillum of cholera, with a view of determining how far these agents could be relied upon to limit the viability of the spirillum of infected clothing, merchandise and nails coming from infected ports. In view of the possibility of having to deal with the bubonic plague, it was thought that it might be of value to repeat these experiments with the organism of that disease. Some work has already been done in this direction by Kitasato and Yersin, but it was done under adverse circumstances and the results obtained were not final. Kitasato found that cover glass preparations of the contents of a bubo exposed to the air of a room at 28 to 30 degrees C. showed no growth after four days. Other cover glass preparations exposed directly to the sun's rays showed no growth after three or four hours. He found that beef-tea cultures heated

for thirty minutes in a water bath up to 80 C. were destroyed. At 100 C. in the vapor apparatus they were destroyed in a few minutes. It will be seen that these experiments were made only with thin films, and in the first or desiccation experiment, no effort was made to exclude the sunlight, and in the second or sunlight experiment, the film must undergo desiccation at the same time. The culture with which the following experiments were made was obtained through the kindness of my friend, Dr. W. F. Arnold, United States Navy, who obtained it from Yersin in China, and brought it directly to the United States, renewing it at once at San Francisco. Upon obtaining the culture, I transferred it to suitable media, and proceeded to test its virulence on susceptible animals, such as guinea pigs, mice and rabbits; the results showed that it was still very virulent.

THE THERMAL DEATH POINT.

The method used was that of Sternberg. A series of five cc culture in beef-tea were made in tubes of a uniform shape and size, and these were allowed to incubate for twenty-four hours. They were then exposed for ten minutes (a previously ascertained time being allowed to bring the temperature of the culture up to that of the bath), in a water bath at the following temperatures: One at 50, one at 52, one at 54, one at 56, one at 58, and one at 60 degrees C. From each one, after cooling down in the temperature of the room, transfers were made into fresh beef tea, and these transfers placed in the incubator. After twenty-four hours' incubation it was seen that the ones exposed at 50, 52, 54, 56 and 58 showed a good growth. The one at 60 did not grow.

Another series was started at points between 58 and 60, with the result that the ones at 58, 58½, 59 and 59½ showed a growth, while the one at 60 did not grow. This would seem to fix the thermal death-point at 60 C. (140 F.) for ten minutes' exposure (moist heat).

HOT AIR DEATH POINT.

It was decided to use infected articles of different absorbing properties, and, consequently, different degrees of desiccation, so as to approach the natural conditions as nearly as possible. Cover glasses, pieces of filter paper and small pieces of wool blanket were chosen for these reasons, and also because the same articles were used in the cholera experiments in 1892. These articles were placed in Patri dishes and sterilized at 150 C. for one hour. They were then infected, each piece with a drop of twenty-four hour bouillon culture. They were then left in a dark closet over night

to dry, and the next day placed in an oven kept at 40 C., corresponding to the thermal death-point moist heat. Every hour a piece of glass, paper and blanket was removed and transferred to fresh media, and placed in an incubator at 27 C. The following results were obtained:

At the End of One Hour—Paper, lived; glass, died; blanket, lived.

At the End of Two Hours—Paper, lived; glass, died; blanket, lived.

At the End of Three Hours—Paper, lived; glass, died; blanket, lived.

At the End of Four Hours—Paper, died; glass, died; blanket, lived.

At the End of Five Hours—Paper, died; glass, died; blanket, lived.

At the End of Six Hours—Paper, died; glass, died; blanket, lived.

It will be seen that the bacillus died out before the end of the first hour on the glass, before the end of the fourth on the paper, and was living at the end of the sixth hour on the blanket.

SUNLIGHT.

The weather has not been favorable for experiments with sunlight, and no day has occurred on which the sun has shown for long periods at a time, the largest continuous exposure obtainable being seven hours.

Twenty-four-hour cultures in bouillon and fresh cultures on slanting agar tubes were exposed to the direct rays of the sun. The fluid cultures and the moist media were used to eliminate the question of desiccation in these experiments. Transfers were made at regular intervals, as long as the sunlight lasted. Up to seven hours all the cultures grew.

DESICCATION.

The object of this experiment was to ascertain how long the bacillus would survive on the glass, paper and blanket at the temperature of the room (210) in a dark closet excluded from the action of the sunlight. A series of test tubes were taken and their closed ends broken open. Pieces of cover glass, filter paper and blanket were then placed in the tubes, the ends of which were plugged with cotton and then carefully sterilized. The object of this was to secure a normal circulation of air. The pieces of paper, glass and blanket were then infected, each with a drop of twenty-four-hour

old culture and the tubes placed in a dark closet. At intervals of seven days these infected pieces have been removed and placed in fresh media. On all these material the bacillus has survived up to the date of this report, forty-two days.

CONCLUSIONS.

1. The thermal death-point of this organism is one or two degrees higher than that of the majority of pathogenic bacteria of the non-aperulating variety.

2. Differing widely from cholera, sunlight and desiccation cannot be relied upon to limit the viability of this bacillus under commercial circumstances.

3. Rags, mails, ballast and general merchandise coming from infected ports should be subjected at either the port of departure or the port of entry to a thorough system of disinfection.

EFFECT OF VARIOUS CHEMICAL DISINFECTANTS.

Experiments have been made in this laboratory only with carbolic acid. It has been found that an exposure for two hours to a 1 per cent. solution of carbolic acid suffices to destroy the life of the bacillus. This observation has subsequently been confirmed by Kinyoun. I quote from a recent article by Dr. Wyman some experiments made in the laboratory of the Marine Hospital Service on cultures furnished by this laboratory, on the value of different disinfectants in destroying this bacillus:

Fornaldehyd.

	5 min.	10 min.	15 min.
1 to 1000.....	No growth.	No growth.	No growth.
1 to 2000.....	Growth.	Growth.	No growth.

"INDISCRIMINATE" SLAUGHTER OF CATTLE FOR TUBERCULOSIS.*

BY PROF. JAMES LAW,

Head of the Agricultural Department, Cornell University, Ithaca, N. Y.

This communication was in response to a resolution adopted at the previous session of the club and referred to Prof. Law for an expression of his opinion. The resolution was as follows:

Resolved, That in the opinion of this club the disease known as tuberculosis is not of such general prevalence as to warrant the

*Communication read at the meeting of the Central New York Farmers' Club, Albany, January 22, 1897.

indiscriminate slaughter of cattle that has occurred, or any appropriation of public money to continue the work of the commission.

It was believed by the club that an expression of opinion from Prof. Law on the question of tuberculosis would be of great interest, not only to the farmers, but to all users of dairy products. The response of Prof. Law is given in full, as follows:

TUBERCULOSIS COMMISSION,
STATE OF NEW YORK,
ITHACA, N. Y., Jan. 18, 1897.

J. H. MARVIN:

Dear Sir—In answer to your favor of the 13th inst., I think that a tuberculosis commission which has no means, except to pay the salaries of the two commissioners and which therefore can do no useful work, is essentially misleading, as conveying to the general public the impression that tuberculosis is being cared for, when in reality it is being neglected.

At the same time I am sorry to see in the resolution passed by your club, January 9, the implied charge of "indiscriminate slaughter." It is true that such a thing as "indiscriminate slaughter" cannot be too strongly condemned. It is only by careful discrimination in every part of the sanitary work that any lasting good can be secured. But on sober second thought (I think) the club would see that this charge is altogether too sweeping. Two years ago I was named on a special commission, and attended its meetings, and saw what was being done. The means available for that commission were too small to allow of any systematic work looking to the immediate suppression of tuberculosis in the animals of the State—it was indeed never intended to compass this end—and the State money reserved for the testing of herbs in the different counties throughout the State, so as to ascertain something as to the general diffusion of the infection. These herds were examined only when the owners requested the examination. The "slaughter" in all such cases was on the request of the owners, and was not compulsory, much less indiscriminating. The only exception to this was in the case of the dairy herds supplying Schenectady with milk. There the local health board requested our co-operation in purifying the milk supply of the city. Whatever pressure was brought to bear in this case was exercised by the city health board. Our commission only furnished inspectors, appraisers and indemnities at State expense, but exercised no authority nor compulsion.

Had any systematic attempt been made to suppress the disease, uniformity of action and a progressive advance would have been necessary, and any one obstructing the work would have had to be subjected to compulsion, just as in certain States the farmer is compelled to eradicate his Canada thistles, but during my connection with the commission it never attempted to accomplish this systematic work, not having been furnished with the means, and it never had any occasion to exercise compulsion on the owner of stock. It would have been unjust to compel the slaughter of animals, until we had the means of holding pure the territory which we had purged of the infection. I also undertook, on behalf of the commission, during that year of service, an investigation into the action of tuberculosis on non-tuberculosis cows, giving my services in this, as in the general work of the board, without any personal remuneration.

It is not encouraging to any one who has given faithful, hearty and gratuitous services, to find afterwards that he is charged by implication with having contributed to such an act as "indiscriminate slaughter." I repeat that I do not think your club could have seen the full bearing of its charge.

The expression of the opposition of the club to "any appropriation of the public money to continue the work of a special commission" will, I fear, be quite generally construed to mean opposition to any government action for the suppression of tuberculosis. I cannot suppose that this was the purpose of the meeting, yet this will probably be the impression conveyed to the general reader. It may be that the club has not had its attention drawn to the dangers of the present situation, and therefore I may be excused for presenting one or two considerations.

At present no one can feel perfectly safe in purchasing fresh stock, and the danger is often even greater in the case of the animal with a valuable pedigree than with common stock. The valuable bull, being placed at the head of the herd, has the best opportunity to spread any infection he may carry, and if the seller has any indication of failing health, or any absence of thrift, he becomes especially anxious to dispose of that animal. The animal bought to improve the herd may well, therefore, be the one that is to be most strongly suspected.

A still more serious condition besets our importations by way of Buffalo. The laws of several of the New England States permit the importation of animals only after they have successfully stood

the tuberculin test. Cattle brought from West Pennsylvania, Ohio, Michigan, etc., are accordingly stopped at Buffalo and there tested. Those that give no indication of tuberculosis are forwarded under the certificate of soundness to New England, while the tuberculous ones that have failed to stand the test are sold to go into our New York State herds. The system is equivalent to making New York the dumping ground for the tuberculosis of the West. No surer method could be devised for increasing the tuberculosis in our State herds. Yet, so far as I know, nothing has been done by our tuberculosis commission to put a stop to the evil.

From the New England side our State has also suffered largely. Owners of thoroughbred and other cattle in New England, rather than have their suspected animals condemned by the State officials, have sold them to unsuspecting New Yorkers, and thus our State has been placed between two fires—one assailing it on the west and the other on the east.

Now, as to your inquiry as to our readiness to investigate cases of tuberculosis when invited to do so: We are anxious to do all we can for the stock-owners of the State.

In the first place, any specimens of suspected tuberculosis, sent to us wrapped in salt, or suspended in spirits, shall have our prompt attention and will be reported on. The same remark applies to specimens of other diseases suspected to be contagious. We have already started work on our laboratories on tuberculosis, glanders, swine plague, contagious abortion of cows and contagious pneumonia of the horse. We have visited different parts of the State to obtain the material for such work. The work itself can be continued in the laboratory without in any way neglecting our duties as teachers, which demand daily and constant application in class room, laboratory and clinic.

If the State should see fit to charge us with the supervision of the contagious diseases of animals, it would certainly be entitled to expect better, because more scientific, service than if this duty were placed, as at present, in the hands of those who have had little or no training in the pathology of the lower animals; but it would be desirable to add to our staff so as to enable us to do the best work in both fields. The mutual helpfulness of the work in the State, among the herds, and the supplementary work here in the laboratories of the State college, would contribute to make the work fuller and better, both among the herds and in the class

rooms, and make both college and sanitary work increasingly valuable.

If, on the other hand, the State should prefer to have the field work directed from outside the college, yet the outside directorate should be indissolubly linked to the college laboratory, so that the two fields of work shall be mutually helpful, and that the greatest possible benefit may be reaped by the State. Our laboratories are already provided by the State, so that that part of the work can be accomplished here at little or no expense and to far better purpose than elsewhere.

Even if we could spare time to answer every call throughout the State, under present arrangements, we would come without any authority to act for the State, and apart from private action, no step could be taken to prevent the diffusion of even the most subtle or dangerous contagion, until the properly authorized official could be sent from Albany. In other words, every step would have to be taken twice and at double expense.

In the case of important and extraordinary outbreaks, we would not let this consideration stand in the way; and when the acting government official calls upon us we shall do our best to respond and co-operate promptly, yet it does not seem best in ordinary cases to spend the government money entrusted to us to do a work that must all be done over again before it can have any legal recognition.

We shall always be thankful to parties who may inform us of extraordinary cases or of dangerous outbreaks, and (wherever it can be done to advantage) to co-operate in sanitary work. I may add that if your club should at any time desire a talk on one of these subjects, one of us will take pleasure in meeting with you for that purpose. Very respectfully, JAMES LAW.

The letter was the subject of a general discussion, in which those who participated evidenced a desire to understand the matter more fully, both for their own sake and that of their patrons; as one of the speakers said: "Tuberculosis in the human family is said by some to exist only through infection from the bovine family, therefore the question is of vital importance to all users of milk and other dairy products."

MILK POLLUTION.

Dr. Huff, Inspector of Animals and Dairies of the Board of Health of Rome, N. Y., at the regular monthly meeting of the board, April 1, read a paper on "The Inspection of Animals and Dairies," of which the following is an abstract:

Consumers of milk have often asked me what was the cause of a peculiar odor, characteristic of new milk that is usually considered as being one of the necessary elements of milk? My observation leads me to believe that nine-tenths of the so-called "animal odor" is caused by imperfect circulation in the skin of the animal and by particles of dung falling into the pail of milk. Cattle are milked in stables reeking with filth, and with swarms of flies congregated upon the strainer that is placed upon the can, and the milk is filtered over the carcasses of drowned flies that may have just been feeding upon the sputa of a consumptive or regaling themselves upon other putrid or offensive matter, and their excrement is washed into the can of milk to be sold to the public. The udder is frequently washed by dipping the hand into the milk that is in the pail, or by milking into the hand and then washing the teat with the milk. Very seldom will one see the udder washed with clean water or wiped with a clean cloth. And it is said that in cases after the cow had put her foot into the pail half full of milk, the milk went in with the rest and the consumer was none the wiser. A very small percentage of dairy farms are supplied with water of good quality and sufficient quantity. As a healthy cow will consume from 60 to 100 pounds of water per diem, the influence that a supply deficient in quantity and quality would have upon the milk is obvious. It is not an uncommon thing to see the drainage from the stable passing into the stream from which the cows drink. Cows confined to the stable require a space of 800 square feet each to obtain sufficient oxygen to aerate the blood properly, but we usually see cattle huddled together in as close a space as possible, generally allowing each cow about 275 to 300 square feet, where they are compelled to breathe and rebreathe the contaminated atmosphere because the dairyman informs us he can get more milk from them if they are kept close together. The majority of stables are built as cheaply as possible, and are roughly finished inside and out, furnishing nooks and crannies for dirt to

locate and to propagate disease. The floor frequently consists of twelve-inch planks, laid side by side, just where the hind feet of the cows are placed and the milker stands when milking, and a trench about a foot wide behind the cows for the excrement to fall into. There is not one stable in a hundred that has any way of flushing, and no greater percentage has any system of drainage. There are stables that have stood for years upon the same ground and have contained hundreds of cows, and all the liquid manure made in them has been allowed to soak into the ground and there remain.

There has been so much said about milk containing germs of disease that it seems almost unnecessary to mention the fact, but we are so forcibly reminded that dirt and filth are the abiding places of disease and that cleanliness is the surest guide to health, that your attention is again called to it and you are again warned of the danger that exists. The dairyman is a citizen and entitled to all kindness and courtesy, and in making changes in the arrangement of stables and methods of handling the product, we should remember that we are in a position to be of great assistance or to work a cruel hardship. We should endeavor to make changes in a kindly manner, but with all the firmness that a public servant should have. No honest dairyman should or would object to a strict observance of sanitary measures, but the dishonest dairyman must be controlled.

A MACHINE TO MAGNIFY ODORS.—A machine which will magnify odors, just as the microphone does sound, is said to have been invented by a Binghamton, N. Y., genius. The story is rather Munchausenish; but if it be true, the invertor has evidently made a mistake. What the general public wants is a machine that will seize an able-bodied smell, like that of Limberger cheese or Brooklyn water, and instantly reduce it to zero. Perhaps the Binghamton man's device will do this already if it be run backward. Why not try the experiment?

JAM IT.—At Frank's house they had quince jam for supper, but Frankie had been ill, so his mother said to him: "Frank, you cannot have any jam. It will make you sick, and then you might die." Frank took this like a little man until he saw his mother help herself to jam the second time. Then he pushed his plate slowly toward the forbidden dish and said with deliberation: "Well, if you are going to die, I might as well die too. Gimme some!"

BORIC ACID AS A FOOD PRESERVATIVE.

At a recent meeting of the San Francisco Board of Health, Dr. W. T. Wenzell, the City Chemist, reported having analyzed twenty-three samples of tomato catsup. Twenty-one of these were found to contain salicylic acid, and two boracic (or boric) acid. The law forbids the use of any other than food substances in such preparations for the table—hence the presence of these articles, though added for the purpose of preservation and not adulteration, was unlawful.

The value of the crusade against food adulteration can hardly be overestimated. Its success, however, is largely dependent upon the intelligent discrimination made between active and dangerous agents, and those which are inert and innocent.

Salicylic acid has become somewhat widely known as a remedy for certain kinds of rheumatism, and is so active a medicinal agent as to render its free use unsafe except when given under direction of a physician.

Boric (or boracic) acid should in no sense be associated with salicylic. It is an altogether different article, though less known to the medical profession, because less used as a medicine. For preservative uses, however, it has been long in use in England and Germany, and consequently the profession there are much more familiar with its action and uses.

Dr. Binswanger, in an essay especially treating of the physiological effects of boric acid, to which the first prize was awarded by the medical faculty of Munich in 1844, says of boric acid:

"It possesses very slight physiological properties. In small doses it becomes speedily absorbed, and is eliminated by the kidneys, whose secretion is promoted. As a medicine it has less value than carbonic acid, to which it is analogous."

Cullen, a great medical authority of the last century, gave it in large doses without observing that it produced any effect on the human body.

Coming down to more recent authorities, the following extracts from a report made in January, 1892, by the late Dr. Redwood, emeritus professor of chemistry to the Pharmaceutical Society of Great Britain, on the use of antiseptics for the preservation of food:

"A question has recently been raised with reference to the use of boric acid and its preparations, for the purpose of preserving certain articles of food from the decomposition to which they are naturally subject, and some opinions have been expressed which are unfavorable to the use of such preservative agents. It is a very important fact, however, in connection with this subject that the statements which have been made in condemnation of the use of boric acid preservatives are in no instances founded on direct observation of any ill effects that have been traced to such use.

"The objections which have been urged are merely founded on assumptions of a more or less speculative nature. The strongest of them are mere matters of opinion, with no well defined evidence, and more frequently they partake of the character of precautionary guards against the possible abuse of a practice if left in unskilled hands. That a careful oversight should be exercised and strict and authoritative checks imposed with reference to the nature of the preservatives, and the extent to which they may be applied, will be freely admitted by all reasonable persons. It is also, no doubt, desirable that strict and careful observation will be made by competent medical authorities with the view of ascertaining whether any, if so what, ill effects may result, not only from the use of boric acid, but also of other preservative agents which might be used for a similar purpose.

"Boric acid has hitherto been looked upon as the most unobjectionable of the substances that have been tried. It possesses characteristics and properties which peculiarly adapt it for this particular purpose. It is one of the mildest of all known acids, being in this respect comparable to carbonic acid, which is contained in atmospheric air and in all good, potable waters. In fact, boric acid, although it bears the name of an acid, has but few of the properties of that class of compounds. Unlike most other acids, it is devoid of a sour taste or acrid and corrosive action when applied to the skin. It may be put into the mouth in its most concentrated form, without any ill effects and with merely a slightly bitter taste. Like carbonic acid, it combines with the alkalies without neutralizing the alkalinty of definite compounds so produced, borax, which is an alkaline salt, being the most important of these. This salt, which owes its efficacy partly to boric acid and partly to the soda with which that acid is combined, is frequently employed as a topical application for allaying irritation of the skin, and is thus often applied to the mouths of young children as an approved remedy for thrush and other similar affections.

"One writer contends that no antiseptic other than salt ought to be added to food. All other antiseptics, he says, have the effect of retarding the digestion of food and are consequently injurious. It is, of course, easy to make rash statements of this description, but in the absence of reliable evidence for their support they are utterly worthless. Salt is undoubtedly a valuable antiseptic, but the too free use of salted food is not free from objections, nor can exception be taken to the employment of many other antiseptics, such as pepper, essential oils, various spices, vinegar, etc. These are all largely employed as antiseptics, and in some cases as preferable to salt.

"One of the strong arguments in favor of the use of boric acid preservatives is founded on the fact that the better class of these preparations is capable of producing the required effect when added to articles of food in very minute quantities, and that when thus used their presence is not perceptible to the senses, while at the same time the food itself has retained its natural physical characteristics. The action of the preservative is in the direction of retarding the spontaneous changes or decomposition, to which many articles of human food are subject, especially in certain states of the atmosphere. When the preservative is judiciously applied the decompositions referred to are so far checked as to admit of much good wholesome food being used as such, which would otherwise be either wasted or consumed in an unwholesome condition.

"Thus milk, which is an important article of food, is daily supplied to almost every household in all our great cities, and for that purpose is now with great advantage brought from agricultural districts, often at considerable distances, could not be thus supplied in an unchanged condition in hot weather without resorting to the most efficient means of checking the decomposition which so speedily commences. Would it be desirable to return to the old practice of keeping cows in London and other cities for supplying the inhabitants, as formerly, with milk of very inferior quality?

"Or is the use of milk in which the process of souring and decomposition has commenced to be permitted without a question as to its effect on the health of those, especially children, for whom it forms so important an article of diet, while at the same time the effect of a trace of an efficient, and as far as is known perfectly harmless, preservative is subjected to a severe, if not an unjust, criticism? So also fresh, unsalted butter, in a perfectly sound and

palatable condition, is, through the use of boric acid preservatives, brought within the reach of a larger portion of our population who would otherwise be deprived of its beneficial use, for of all obnoxious articles of food none surely surpasses rancid butter with its free butyric and other allied acids, the injurious effects of which cannot be doubted. No attempt has been made by the circulators of the vague adverse statements referred to to institute experiments for the purpose of ascertaining from direct observation whether now or at any time during the several years that preparations of boric acid have been extensively used for the preservation of milk and butter, there have been any instances in which injury to health has resulted from even their habitual employment."

Dr. Stevenson, the scientific adviser to the Home Office Department of the English Government, and the authority to whom all matters connected with poisons are referred by the government, states that one per cent. of boric acid in an article of regular consumption, as butter, is not known to have been followed by serious effects.

The medical profession in this country, as well as England, have proved generally friendly to the use of boric acid as a preservative, knowing so well its antiseptic qualities. Some few ambitious analysts, however, have echoed the ignorant opinion that its use retards digestion, and hence is unsafe in milk given to infants.

There seems to be two sufficient answers to this sweeping judgment: First, the exceedingly small proportion of boric acid that is thus taken into the system with the food, and the positive results of careful experimental tests as to the influence of boric acid upon the processes of digestion.

Prof. Chittenden of Yale University, after a careful study of the subject, gives as the result of his experiments an unqualified opinion, published in full in the "Dietetic and Hygienic Gazette" for February, 1893:

The general use of borax and boracic acid as preservatives, especially of food products, renders it very desirable to have some definite knowledge concerning their action on the ordinary processes of digestion. This is obviously a matter of considerable importance, for in the preservation of meat alone, as in the exporting of beef, considerable quantities of these agents are employed to assist in keeping the meat fresh during its long transportation, and consequently are introduced into the system when the meat is eaten. It becomes, therefore, a matter of vital importance to know whether these agents have any injurious effect on digestion when so consumed. There is no question that both borax and

boracic acid are efficient antiseptics, and hence useful as preservatives of organic matter, retarding decay and preventing putrefaction. It is likewise known that they are devoid of ordinary poisonous properties, but before their general use can be sanctioned in cases where some preservative is necessary, we must be very sure that they do not have any injurious effect upon nutrition, and especially upon digestion. For example, will meat (or any food stuff) which has been preserved by the presence of borax or boracic acid be as readily digested as fresh meat? Will the presence of these substances in the alimentary tract have any injurious or retarding effect upon the several digestive processes to which food must be exposed before it can be absorbed to supply the needs of the body?

In an attempt to answer these questions a careful study has been made of the influence of both borax and boracic acid upon the chemical processes of salivary, gastric and pancreatic digestion. As the result of a long series of experiments with the several digestive juices, it may be stated that the presence of moderate amounts of boracic acid do not materially interfere with the ordinary starch digesting power of saliva. Borax, on the other hand, more noticeably diminishes the rate of salivary digestion; but when present in such amounts as to completely saturate the starch-containing solution there is no destruction of the salivary ferment, and no complete cessation of ferment action; conversion of starch into sugar still goes on, even under such adverse circumstances, a fact which tends to emphasize the comparative harmlessness of borax on salivary digestion. The worst that can be said in this connection is, that moderate amounts of borax tend to diminish the rate of action of the salivary ferment. Small amounts of boracic acid, however, even increase the starch-digesting power of saliva.

With gastric digestion the results of several experiments show that the presence of moderate amounts of boracic acid not only do not impede the digestive power of the secretion, but, on the contrary, actually increase the proteid-digesting power of the ferment. Thus in a vigorous digestion of coagulated egg albumen with artificial gastric juice, far more albumen was dissolved in the presence of one per cent. of boracic acid than in a similar digestion where boracic acid was absent. Even the presence of 25 per cent. of boracic acid may not check at all the digestive power of gastric juice on egg albumen.

Likewise borax, when present in very small amounts, appears to increase somewhat the digestive power of artificial gastric juice. This increase of digestive power is, however, more quickly followed by retardation as the percentage of borax is increased than with boracic acid. It seems reasonable to assume, however, on the basis of the results obtained, that such quantities of borax or boracic acid as would ordinarily be taken into the stomach, either for therapeutical purposes or mixed with food as a preservative, would not have any pronounced retarding effect upon the purely

chemical process of gastric digestion, but might, on the other hand, actually increase the digestive power of the secretion.

In the pancreatic digestion of albuminous matter, borax, even when present in very large amount, has a marked stimulating effect, leading to the digestion of much larger amounts of albuminous matter than the same quantity of pancreatic juice alone would accomplish. In fact, under some conditions the digestive mixture may be almost saturated with borax without checking in the least the digestive action of the artificial pancreatic juice.

With boracic acid pancreatic digestion is not so greatly stimulated, but the presence of even one per cent. of the acid does not sensibly diminish the rate of digestive action.

It is thus evident that borax and boracic acid, when present in the stomach and intestines in moderate quantities, can have little or no injurious effect upon the more important chemical processes of digestion. On the contrary, the presence of these agents may, in some cases at least, even accelerate the normal digestive processes of the alimentary tract.

The authoritative testimony of one such competent investigator, who has made exhaustive tests, is worth far more to the public than the timid fear of a hundred who ignorantly assume that it is harmful.

Boron is one of the few non-metallic elementary substances nearly related to carbon, but much less familiarly known. It exists in three different degrees of hardness, corresponding to the charcoal, graphite and diamond states of carbon—the hardest variety being as hard as diamond. United with oxygen—one part boron to three of oxygen—it forms boracic or boric acid.

Boric acid is found in nature, and is also artificially produced in combination with soda—boric acid, two equivalents, soda one, forming a biborate of sodium, or the borax of commence.

An acid in chemistry implies, simply, capability of uniting, with an alkali as a base, to form a salt. Boric acid should not be confounded with the destructive or poisonous liquid acids, such as nitric, sulphuric, muriatic, etc., which it does not resemble in appearance, qualities or uses. Boric acid is not a liquid, but a clear, white, flaky crystal.

It is scarcely sour to the taste, and is in no sense caustic, an irritant or harmful to the most delicate tissues. It is distinctly healing and sedative, allaying inflammation, and is much used by surgeons as a dressing for wounds.

For common household cleansing purposes boric acid is not intended to take the place of borax, which is superior as a lubricant and softens water to a greater degree.

But as an antiseptic for general preservative purposes, boric acid has undoubted advantages and may be used with the same assurance as to its efficiency and harmlessness.

The "National Provisioner" asserts that it is the best preservative known for any kind of meats. By its use all shrinking is avoided, and the taste or flavor of the meat is not impaired.

Boric acid is as safe to use as salt, and even more effectual, in keeping fish, flesh or fowl from decay, and can readily be removed by washing in water. If thoroughly dusted on to any kind of uncooked meats, there is no question about keeping them fresh. It is easily applied with a little bellows, a sugar sifter, or a pepper box, or can be thrown on with the hands, and in warm weather its free use is much more economical and satisfactory than ice. A pinch in milk will keep it sweet, and raw fruits and vegetables may be preserved the same as meats. These are household recipes worth knowing.

Boric acid in the dry crystal or powder is of greater strength than borax, in about the proportion of three to two.

The crystal is, however, harder or less soluble; hence a "saturated solution," or all that water will take up at the ordinary temperature, contains less boric acid than a solution of borax, in about the same proportion as the crystal only reversed, *i. e.*, boric acid two borax three.

NEW YORK SWEAT SHOPS.

State Factory Inspector O'Leary's report for the year 1896 shows that a total of 27,425 inspections were made during the year, an increase of 6,240 over the previous year, and included manufactories, bakeshops, mines and mining plants. In the establishments visited there were employed 537,702 persons, 159,226 of whom were women, of which number 53,997 were under twenty-one years of age. There were 12,100 children over fourteen and under sixteen years of age. There were eighty-four children under fourteen years found employed, as compared with 211 for 1895, and 185 illiterate children, as compared with 310 for 1895.

The report says that the amendments to section 2 of the law relating to child labor, which were recommended by the Reinhard Investigating Committee, are working beneficially for those children whom it was designed to protect. It has had a most salutary effect in checking abuses heretofore complained of and of prevent

ing the promiscuous employment of those children who are neither mentally nor physically fitted to be forced into the shop or factory.

The inspector recommends a further reduction of the hours of labor for women under twenty-one and youths under eighteen from sixty to fifty-eight hours per week.

The sweat shop and sweaters are treated at length in the report, which says in part:

"It should be borne in mind that the power of the officers of the Inspection Bureau is limited and their duties prescribed by law. The department can abate the evil of overcrowding factory workrooms, but it cannot prevent the overcrowding of rooms in tenements which are used as workrooms by members of the family. The officers of the department can force the child under fourteen years of age and the illiterate child out of the workshop or factory, but are powerless to molest them when they are found employed in their own home circle. The department can cause the reduction of excessive hours of labor required of women under twenty-one and youths under eighteen years of age, when employed in shops, but it cannot prevent such long hours of toil being imposed on persons of the same age when employed at home.

"The department has no power to interfere with the right of contract. The department has no power which will enable it to force the contractor, jobber or sweater to pay greater prices to the worker than that for which they offer to do the work or than the contractor is willing to pay—prices usually which will permit the worker to starve while he works. If the manufacturer is justified in getting his goods made up at the smallest possible cost, then it follows that the man who contracts to do the work for the manufacturer is equally justified in forcing and compelling those whom he employs to work for the lowest possible price or pittance.

"With knee pants bringing but from 50 to 75 cents per dozen, vests from $1 to $3 per dozen, trousers from 12½ to 75 cents per pair, and coats from 32 cents to $1.50 each—with a percentage off these prices for the 'boss sweaters' and another deduction off for cost of cartage, which the workman is obliged to pay—we cannot expect to find anything but destitution, suffering, intellectual and moral depression existing among the unfortunate victims of this pernicious system. In New York City alone we have about 400 wholesale clothing manufacturers or jobbers, and nearly all of these utilize this kind of labor. There are nearly 150 wholesale cloak houses in the same city, and only a few of them have suitable

shops and workrooms of their own in which to do the work. Nearly all ready-made clothing, no matter of what grade, either wholly or partly, is now made up in places of this kind. The contractors who operate fairly good shops as a rule do not complete the garments, but parcel out the minor parts, such as felling, button-holing, sewing on buttons, etc., to sub-contractors or to families, who do the work in tenement or dwelling houses at prices which, after long hours of toil, will produce only a few cents. The condition of the clothing trade in New York City is worse to-day than ever before. We find men going to the employer and offering to work two or three hours extra if only given a chance to work, thus voluntarily subjecting themselves to a condition of slavery. Right here is where all the evils of the sweating system come in, for all complaints are based upon the amount of wages earned, and the laws of the State prescribe no remedy which can be applied at this point.

"When we speak of 'sweating' districts we refer to the localities in our cities where rents are lowest, and consequently the sanitary conditions of buildings are the very worst, and where all classes of foreigners coming to our shores locate. Occupied as they are from early morning till late at night, they have little time, even if they had the inclination, to give a thought to the sanitary condition of their surroundings, which are often simply vile. The possibility of contagion spreading through infected clothing coming from these filthy places is very great. The combination living room and workshop is a positive menace to the health of the community, and the utmost vigilance and activity of the officers of the department are inadequate to cope with these conditions so far as cleanliness is concerned."

The report says that Congress can to a large degree solve the problem of abolishing the evils of the sweating system by more stringent immigration laws, and by a tax system which would force the workers out of tenements and into shop buildings, where the conditions could be fully controlled by State legislation.

"The Bakeshop law of 1895," the report says, "considered from any standpoint, was the most beneficent in the line of labor legislation of any ever secured for the people of this State. For the first time since the passage of the act all bakeries in the State have had one thorough and complete inspection this year. To attempt to describe the condition of many of the places where breadstuffs are produced for public consumption would be impossible. The

reports of the inspectors in many instances show that the filthy and unclean conditions prevailing in the 'sweating' districts do not begin to compare with the unsanitary and foul conditions existing in many of the bakeries visited. But the conditions of the bakeshops to-day as compared with their reported condition when first visited will show the splendid results accomplished by the inspectors and the vastly improved condition of the bakeshops in this State generally.

"The first inspection of the mines," the report says, "showed many of them to be in a very bad and dangerous condition. Boilers and engines were in bad condition, and the manner of handling and treating high explosives in some instances was simply frightful. In one place the inspector found 100 pounds of dynamite under and about the boilers in the engine house; a blaster was priming some cartridges, and about thirty men were standing about, some of them amusing themselves by tossing some of the cartridges from one to another, seemingly totally unconscious of the awful consequences which might result from their fooling. Mines were being operated without regard to system or the provisions of the law. Tamping of high explosives was done with steel bars instead of wooden ones. The ropes, sheaves, hoists, ladders and tramways through and over which men had to pass were in many cases very dangerous. In one place the inspector noticed a mass of rock, directly over several men employed at the bottom of the pit, which looked dangerous. He called the attention of the mine boss to it, and was told that the rock had stood in just that position for years and was perfectly safe. The inspector insisted that the rock be sounded. To satisfy him the boss took a bar and started to sound the rock without saying anything to the men below. The inspector insisted that the men leave the pit, which was done. The boss stuck the bar into a crevice in the rock to pry on it, when, without scarcely an effort, tons of rock fell down into the pit directly into the spot where the men had been at work but a moment before. During the year 1895 there were twenty-seven fatal accidents in the mines. For the year 1896 there were nine. During 1895 nearly twenty of the fatalities were the result of falling roof rock. In 1896 not a single death was reported from this cause. During the year six mines have been condemned as dangerous and the men removed to other workings. Within a short time after being condemned five of these mines fell in."

BUILDING MATERIAL.

EXPERIMENTS ON CONCRETE MADE AT M'GILL UNIVERSITY.

By Messrs. THEO. DENIS, G. G. HARE and CARL REINHARDT, Students, Can. Soc. C. E.

Read Thursday, 19th November, 1896.

Of late monolithic works of great importance have been carried out, and every day concrete, as building material, is creeping to a foremost place.

Although cement testing proper has been subjected to elaborate scientific and practical investigations, very few researches, and especially normally conducted researches, have been made on the strength and behavior of concretes and betons. This probably is due to the fact that for such experiments heavy and costly apparatus is needed. Investigations on small specimens would be useless, and conditions approaching as nearly as possible to practice have to be followed.

The following are the results obtained from a series of experiments made by students of McGill University, 1895-96:

The object of this first series of experiments is to determine the effect of different per cents. of water on the strength of the concrete. The limits were 16 and 30 per cent. of water, by weight of cement and sand, which are beyond the extremes of practice on both sides.

CEMENT.

The cement used was, of course, the same brand throughout the series. It was a German Portland of good quality, slow setting, on which separate sand tests were made in connection with this series. The results are tabulated below.

SAND.

This was clean, coarse, angular, dry sand of good quality, of slightly higher grade than usual practice.

STONE.

This was broken limestone of such size that the pieces would have passed through a ring 1¼ inches diameter. They were unscreened, and just as they came out of the breaker. Consequently a slight amount of dust was mixed with them. They had to be

broken a little smaller than in actual practice. The blocks of concrete being only one cubic foot, it was thought that more accurate results would be obtained in this way.

MOULDS.

The moulds were made of ¾ inch plank, lined with sheet zinc. They were 5 feet long, 1 foot high and 1 foot wide, divided into four compartments, which would mould four cubes at once, of dimensions 1 x 1 x 1 feet, forming specimens large enough to investigate seriously upon. These were removed by unscrewing one side of the box and sliding them out. Care had to be taken to oil the sides of the mould slightly before ramming the mixture in them, to avoid trouble in getting them out.

CONDITIONS OF MIXTURE AND PROPORTIONS.

The proportions adopted for this series were one of cement, two of sand, and four of stones, by weight, the proportion of water being based on the weight of sand and cement.

The cement and the sand were first thoroughly mixed dry, then the water added gradually. The stones were then thrown on this mortar, spread out, and the whole vigorously and very thoroughly mixed. The fresh concrete was then placed into the moulds and rammed in 1½ to 2 inch layers.

RAMMING.

The rammer was a block of hard wood 2 feet long by 2 x 2 inches, with a lathe-turned handle. It was not very easy with this to ram uniformly, even throughout one block, and this is one of the main sources of discrepancies in this series of experiments.

It was thought that a reduction of the breaking loads to a standard weight of the blocks would be only fair, and would slightly improve the results.

GROUPING OF TESTS.

The tests were made at one week, four weeks, and two months, and the results grouped accordingly, that is to say, the one week tests, with different per cent. of water, compare between themselves, four weeks and two months likewise. Parallels between the results, at different ages, cannot be drawn on account of some specimens having been prepared under widely different conditions. For instance, the results at two months are exceedingly low as compared with those obtained at one and four weeks. This is due to the fact that these two months' specimens were the first prepared of all, and this before the cemented trough in which they were to be immersed was completed. Consequently they were

kept 8 to 10 days longer than the others in the dry air of the laboratory, which seems to have had a disastrous effect on them. But in spite of these slight drawbacks, the annexed table shows that up to 24 per cent., the percentage of water has not a very great effect on the strength. This is an important point, for below 20 per cent. the mortar obtained is rather dry and very difficult to handle.

But beyond this limit of 24 per cent. a greater proportion of water seems to weaken the concrete considerably.

This limit is very sharply defined in the adjoining table, where an additional 2 per cent. of water, from 24 to 26 per cent., weakens the concrete by almost one-half for the one-week tests. It is, however, interesting to notice that strength is almost completely recovered with time, the four-week tests showing the weakening limit to be between 26 and 28 per cent., and the two-months' between 28 and 30 per cent. So that if immediate strength be not required of the concrete structure, 28 per cent. of water will not affect the ultimate resistance if allowed to stand two months.

In the parallel sand and cement tests the weak line is not so sharply defined, but yet it is sufficiently so to show that the same statement applies. The tests in this case show a marked weakening between 14 and 16 per cent. of water for the one-week, which strength is ultimately recovered, as is shown by the four-weeks' and two-months' tests.

The low limit of 14 per cent., as compared with 24 for the concrete, is probably due to the fact that the stones of the concrete, on account of their porosity, absorb a part of the water.

The table shows that the greatest density is obtained with 16 and 18 per cent. The weights of the cubes beyond this decrease up to 24 and 26 per cent., where they are again nearly equal in density to the 16 and 18 per cent. of water. Therefore this 24 and 26 per cent. seems to be the point where the best practical results are obtained, because 16 and 18 per cent. make up too dry a concrete to allow of easy handling.

Another point incidentally comes up. Attention has been drawn to the poor results obtained by the same tests and reason of long exposure to dry air given. This shows up a very important point, namely, the necessity of covering up carefully all concrete and cement works exposed for any length of time to dry air and sun. The bad effect of these agents is plainly demonstrated, and it is doubtful whether much strength would ultimately have been recovered.

It is also interesting to notice the results obtained by the concretes made of 1 part of cement, 2 of sand and 5 of stones, and 1 cement, 2 sand and 6 of stones. The specimens of these compositions gave results equal to concretes, 1, 2, 4, showing that for strength they are as good as the ones containing a less proportion of stones, while being much more economical.

These experiments are as yet very incomplete. But it is hoped that the researches in this subject will be continued, and that valuable information for the engineer in practice derived from them.

CONCRETE TESTS—COMPRESSION.

Proportions by weight: 1 part cement, 2 sand, 4 stone.

Per cent. of water by weight of cement and sand.	Crushing strength per square inch. 1 week. comp. tests.	4 weeks.	2 mos.	Average weight of sp. per c. f.
16	792	677	382	141.5
18	653	679	507	143 0
20	746	626	507	139.5
22	620	615	670	139.5
24	679	542	559	141.5
*				
26	362	545	500	141.2
28	326	340	823	138.0
30	245	331	361	135.5

Proportion by weight: 1 cement, 2 sand, 5 stone.

20		703	

1 cement, 2 sand, 6 stone.

20		728	

CEMENT AND SAND TESTS.

Proportions: 1 cement, 2 sand.

10	825	800	1822
12	800	1311	1666
14	750	1000	1100
*			
16	475	1389	1777
18	395	1110	1266
20	400	913	1633
22	330	844	1233
24	388	——	1230
26	——	——	1000

* Line of weakness due to excess of water.

McGill University, April, 1896.

THE INCANDESCENT FIRE MANTEL.*

By T. E. Pye, of London.

The incandescent fire mantel is an appliance designed to facilitate the combustion of non-bituminous fuel in the ordinary domestic fire-grate, and thereby to secure a fire of pleasing appearance and thorough efficiency, which shall at the same time emit neither smoke, smell nor any objectionable fumes whatever. Wood of all kinds, bituminous coal of the best or of the poorest descriptions, anthracite coal or gasworks coke, will all burn with facility and intensity in any ordinary grate fitted with the fire mantel, whilst the addition of a limited percentage of so-called non-combustible material, such as spent oil shale, cannel coke, etc. (say from 15 per cent. to 20 per cent.), will not materially deaden or even affect the fire.

Of all the fuels just mentioned, there is no doubt that, in view of the claims made on behalf of the new appliance—viz., a smokeless fire which is maintained at about half the expense or an ordinary coal fire, gasworks coke is the best suited for use under the system, and a varied experience of this residual, as employed in conjunction with the mantel, has clearly demonstrated its utility for all ordinary purposes of domestic heating.

It is not claimed in connection with the appliance that in the domestic grate we find an actually new field for gasworks coke: and further, it is admitted that in some few instances this fuel has been successfully employed by gas engineers and other technical men in domestic warming without an admixture of coal or other artificial aids to combustion. It will, however, on the other hand, be readily admitted that if the said field be an old one it certainly has, as yet, been but little worked upon, and that for all practical purposes gasworks coke used alone is, as a popular domestic fuel, a conspicuous and certain failure.

That if burned under conditions suited to its proper and complete combustion gasworks coke would prove an ideal fuel for such purposes has long been known by the most eminent authorities. Professor Ramsay recently pronounced most strongly in favor of the general use of coke. Speaking upon the smoke nuisance, he said: "There is one material—viz., coke, which gives

*A paper read before the Midland Society of Gas Engineers.

out, weight for weight, a greater amount of heat than coal, which emits no smoke, and which produces what all of us are so unwilling to relinquish—a bright glow in the grate. In Paris it is the universal fuel. Could we induce our dense population to adopt coke fires our smoke nuisance would be greatly abated. Paris is a larger city than Glasgow, and yet it is clean and bright, while Glasgow is dark and dirty. The difference is almost entirely due to the fuel burned."

With this introduction I have much pleasure in bringing under your notice the incandescent fire mantel, believing, as I do, that providing what has for so long been required for the proper combustion of the coke, it is destined to do yeoman service for many a perplexed gas manager in assisting him in the profitable disposal of what for so long has been a positive drug on the market.

It is quite unnecessary to take up time at a meeting of this nature in arguing the importance of the considerations arising from what is practically the development of a new industry, and which, if one-half of the anticipations of the promoters of the system be realized, will almost revolutionize the present condition of coke sales. You will also readily anticipate most of what I may say upon the chemical actions attendant upon the use of the appliance, and I propose, therefore, to ask attention for the present more particularly to such practical issues as have already been decided, and to present data of actual experiences.

The fire mantel is, as you see, a simple contrivance, consisting of a frame carrying two rows of air tubes. The frame is placed inside, and close up to, the front bar of the fire grate. When the fire is in operation these tubes convey into the interior, at two different levels, a supplementary supply of atmospheric oxygen. The carbonic oxide produced in the fire is thus met, as generated, by what may be termed the secondary air, the heat attending its conversion to the dioxide being utilized in raising to incandescence all the fuel in the immediate vicinity of the monoxide flame. By this means a large amount of heat is obtained from the incandescent material for useful radiation into the apartment which under ordinary circumstances is in great part or wholly lost, as the well-known carbonic oxide flame, usually noted in considerable amount at the top of an ordinary coke fire, although an intensely hot one, gives out no sensible heat by radiation, and its useful heating effect is actually nil. The place and action of the tubes should not be misunderstood. It is not claimed that the air currents toward the fire are concentrated on the tubes, nor yet that the tubes themselves directly increase the air supply. They do so, however, indirectly, as will be shown presently. What the tubes actually do is to convey a portion of the air, while still containing its complement of pure oxygen, right into the heart of the fire, whereas the bulk of what oxygen enters the fire through the front, in the

ordinary way, is quickly converted into monoxide and dioxide of carbon. Herein lies the secret of the brilliant combustion beyond the tubes, at a point which without them, and especially in a small fire, presents an area of most incomplete combustion and half-black fuel. The intense heat thus set up and diffused in every direction maintains a sharp, upward current of air, which serves a twofold purpose. The heated products of combustion, supplemented by a large volume of rarefied air, and minus the usual complements of smoke and dust and other clogging and weighty matter, possess a buoyancy which, so far as present experience goes, has invariably succeeded in overcoming the worst down-draughts in the ordinary chimney, whilst, as already explained, the CO produced in the fire is already largely or wholly converted into CO^2; and the only remaining fumes to be noticed, due to the sulphur in the coke, are thoroughly aerated in the fire and wholly carried up the chimney, and not the faintest trace can be detected in the apartment. Another very important effect of the rarefied air currents is the suction induced at every point of the fire, drawing fresh supplies of air, and maintaining in the apartment a free and healthy circulation, which insures a constant renewal of the atmosphere and the removal of deleterious gases.

With reference to the cost of the fire, my own experience, at home in the sitting room and in the Company's show rooms, shows a consumption of coke costing at present about 3 cents per day, which will not exceed 4 cents in the winter time. Coke is sold in London by measure, but I believe present prices range from $3.87 to $4 per ton, inclusive. From this data you will readily calculate the relative cost of the fire in any locality. You will probably have already seen the figures given in this connection by Mr. Geo. Lane, of Aylesbury, which are as follows: "For 12 hours' consumption of coke it cost, at 8 cents per bushel, 4 cents to heat a room 15 feet by 18 feet, maintaining a temperature of 65° F."

The manipulation of the appliance is as follows: Having filled in the bottom row of tubes the mantel is placed in position just inside the fire bars, and the fire laid in the usual way with paper, wood and coal. The top row of tubes is then inserted and the fire is lighted. When the coals are well alight coke is added, and is then used alone for the rest of the day. Where upright Bunsen gas burners are available they will provide a ready means of starting the fire without the use of coal.

In conclusion, the claims here put forward of a satisfactory solution of the long-standing difficulty in the way of a universal adoption of coke for domestic heating—large and important as these claims may be and are—are daily being supported by highly respected members of your own profession, whose names are a guarantee of their disinterestedness—except as regards the profitable disposal of the residuals of their undertakings. Mr. F. Livesey, of the South Metropolitan Gas Company, long ago reported most favorably on the utility of the appliance, and I am in-

formed that his staff now recommend it to consumers. The Gas Light and Coke Company tested it under lengthened and severe trials, using two fires side by side, with and without the mantel, with most satisfactory results. And amongst other engineers well-known to us all, Mr. W. Hardie, of Newcastle-on-Tyne, after repeated trials, expressed his complete satisfaction, and desired the Incandescent Fire Mantel Company to publish, on the circulars for that district, the recommendation of his Company. I would much prefer, however, to spare you details of this nature, but—having myself had a lengthened experience of gas management in London and the provinces—I fully appreciate the importance to the industry of the new system, if only the claims made on its behalf can be substantiated. That this is so the independent testimony referred to can leave no doubt; and this testimony is being supplemented almost every day. What will, however, interest you even more is the following. Owing to my connection with the Incandescent Fire Mantel Company I am able to say that the appliance is being received most enthusiastically by the general public in all parts of the country, and that its operation and utility are more thoroughly understood and appreciated than could have been expected for an appliance so new and original. As it becomes better known so the demand increases, and to such an extent as for the moment to seriously embarrass the management in the prompt execution or orders, as probably some gentlemen in this room are aware. The home demand for gasworks coke must, therefore, follow; and if gas engineers will make known to the consumers the unique advantages of the fuel, the new possibilities of using it without unpleasantness and difficulty, and the facilities they have for delivering it at a moderate cost at the consumer's own door, broken ready for use, I am convinced that those of the members who hitherto have had but a poor demand will very soon reap profitable fruits from their new enterprise, which will go a long way to recoup losses on the ever-dwindling values of the other residuals, more particularly sulphate of ammonia.—From "American Gas Light Journal," Nov. 16, 1896.

FREE PUBLIC BATHS.

The public authorities of Brooklyn and several other cities of the State of New York have need to be again reminded of the mandatory act of the Legislature signed by Governor Morton, April 19, 1895, as follows:

SECTION 1. Chapter 473 of the laws of 1892, entitled, "An act to establish free public baths in cities, villages and towns," is hereby amended so as to read as follows:

"All cities of the first and second classes shall establish and maintain such number of free public baths as the local board of health may determine to be necessary. Each bath shall be kept open not less than fourteen hours for each day, and both hot and cold water shall be provided. The erection and maintenance of river or ocean baths shall not be deemed a compliance with the requirements of this section. Any city, village or town having less than 50,000 inhabitants may establish and maintain free public baths, and any city, village or town may loan its credit or may appropriate of its funds for the purpose of establishing such free public baths"

This act shall take effect immediately.

Yet New York and Buffalo are the only cities which have complied with this law, and these but very insufficiently. Surely there should be some way of compelling our city authorities to comply with the laws of the State; above all, with laws such as this one, so necessary to the comfort and health of a large proportion of the people.

The delinquency of American cities in this respect generally was admirably shown in an address on "Public Baths in Europe," before the Social Science section of the Twentieth Century Club, Boston, on the evening of April 7, by Dr. Edward M. Hartwell, who spent last summer investigating the public bathing establishments in the leading cities of Europe and Great Britain, gathering information to be embodied in an official governmental report.

His talk was rendered comprehensive and interesting in the highest possible degree by means of stereopticon views, embracing photographs of the exterior and interior of many baths, as well as architectural plans of many.

Dr. Hartwell showed that America is far behind several of the leading nations on the other side the ocean in the matter of public baths for purposes of cleanliness, as he did not include the ordinary floating bath houses for summer use in that category.

He stated that nearly fifty years ago public bathing establishments were advocated in Boston by prominent citizens, and committees were appointed in the interest of the scheme, although the moving spirits were so far ahead of their time that nothing came of the project.

He said that the taste for personal cleanliness is a modern one, and has come through the congestion of population in large cities, and purely on account of hygienic considerations. The lecturer showed that the baths of Germany are superior to any others in the world, the English, until recently, being indisposed to see the

possibilities of improving on some of their old-fashioned notions, or to benefit from the experiments on the Continent. Thus the English devote more space and more financial outlay to the swimming and the tub bath, while the Germans have carried the shower, or rain bath, to a high state of perfection.

The rain bath the speaker indorsed as the most desirable from the standpoints of cleanliness and economy, it being possible to afford accommodation for the largest number at the smallest outlay by this method. It is the rain bath which will be placed in Boston's first bath house on Dover street.

He asserted that the German bath houses, many of which are very fine architecturally, are on a paying basis, although the individual charge for a bath is only the equivalent of two and a half cents in American money. And, moreover, in those cities where baths for adults are most common, it is the custom to have rain baths in the school-houses for the pupils, and notwithstanding that the time for the baths is taken from regular school hours, it is found that nothing is lost in study, the refreshing and tonic effect of the baths compensating for the loss of time.

In more than forty cities on the Continent baths for the children are found in the school-houses, and in Germany it is the settled policy in regard to new school buildings.

One bath house in Europe, which cost, including all the fixtures, $40,000, accommodates 500,000 bathers annually, who pay less than three cents each for their bath and yet support the establishment.

The speaker laid especial stress upon the greater profit and benefit of rain baths for cleanliness over the old-fashioned swimming baths. He urged that Americans should study the German systems, as they are the most highly developed types.

He quoted one ward in Boston, 89 per cent. of the people of which live in tenement houses, and 99 per cent. of those tenement-house dwellers have no bathing facilities. A bath house with adequate rain baths in that ward, he declared, would be of great benefit, not only to the ward, but to the whole city in an indirect way.

Dr. Hartwell described the wash houses, or laundries, run in connection with many English bath houses. There are set tubs, drying room and facilities for ironing, and women of limited means can do their washing there at the small cost of a penny an hour.

The English build good bath houses at an expenditure ranging from $40,000 to $200,000, and the lecturer commented on the fact that the land alone for Boston's new bath house cost $50,000.

SANITARIA FOR THE TREATMENT OF TUBERCULOSIS IN GERMANY AND SWITZERLAND.

Dr. Kaurin has published in the February number of "Lagwidenskaben," of Christiania, Norway, a very interesting report of his observations on the condition of tuberculosis and its treatment in sanitaria in Germany and Switzerland, from which the following extracts are taken:

The most celebrated establishment of this kind is at Falkenstein, in Nassau, of which Dr. Dettweiler is the director. It is situated 400 meters above the level of the sea, surrounded by extensive forests on the southern slope of Taunus Heights. Not far away is Ruppertshain, a sanitarium for a poorer class of people, costing from two and a half to five marks a day. The climate is dry and a little windy, with a good deal of rain in spring and fall; in the winter the thermometer falls below the freezing point, generally to 8° or 10° Celsius, and a little snow falls. The temperature changes slowly. The buildings are three stories, with corridors for patients on the front—open but protected with canvas against rain and direct sunshine. The regular treatment, lasting three months only, is based on the Bremer-Dettweiler method: The open-air treatment, the treatment in the corridors, and abundant nourishment, with regular exercise to strengthen the heart, and the disinfection of the sputa." Medicine is not much used, mostly to relieve symptoms. The result is very satisfactory, the percentage of cured being 24 (13 per cent. entirely cured and 11 per cent. able to resume work). Of 99 cured, 72 remained well from three to nine years after treatment, 15 had a relapse, and of those twelve were again cured after a renewal of treatment.

The little village, Falkenstein, close by, with 800 inhabitants, seems not to suffer from this so much dreaded neighborhood, inasmuch as the death-rate from tuberculosis here is less now than formerly.

In Switzerland the author first visited Heiligenschwendi, in the Canton of Bern, 1,100 meters above the level of the sea. It is also surrounded by forests and faces toward the south. The climate here is more severe; in winter the thermometer descends to ÷ 37°

Centigrade, and in June the maximum temperature is + 15° C. and minimum + 7° C. The treatment employed was hygienic-dietetic, and was followed by good results.

In the Canton of Graubunden he visited Davos, an Alpine valley, situated 1,560 meters above the level of the sea. The two small villages there are now yearly visited by more than 13,000 people having tuberculosis. The mean temperature is + 2.6° Centigrade, and the mean barometrical measurement 631 millimeters. The snow covers the fields until May, and ÷ 20° to ÷ 30° C. is frequently recorded. From so severe a climate the patients return home much improved in health! In spite of the elevation, there seems not to be any disposition to haemoptysis; whereas it is contraindicated to send patients up there with developed anaemia, neurasthenia, heart or laryngeal affections.

Here in Davos there is a very peculiar institution, a school sanitarium for boys and girls sent by families disposed to tuberculosis, or with incipient phthisis. Boys and girls with poor health are sent up there also, and healthy children from the neighborhood frequent the same school.

From Switzerland the author visited some places farther north, in Sudeter Mountains, and praises Gorbersdorf, which is situated 560 meters above the level of the sea. Here, as in Davos, the patients with fever are kept out in the fresh air and with good effect. Here also, as in the other places, 24 per cent are cured.

In the suburbs of Berlin he visited the barracks of Doeckert, situated in a large pine grove and given up to the Red Cross Society, for the benefit of tuberculous people. The cost per day is three marks per capita. Here, as well as in Malchow and Blankenfeldt, are two hospitals for tuberculous patients from Berlin hospitals, and situated on the plains irrigated by the Berlin sewers. The result is very satisfactory. In Malchow and Blankenfeldt the cost per day is only two marks and the treatment does not last more than forty-four days. Even if not cured in this short time, the patients go back to their homes in the city improved in health and trained to a better mode of living.

Both in Germany and Switzerland he found all the people interested in the great war against tuberculosis.

H. Bryn, M. D.

Brooklyn, N. Y., April 10, 1897.

THE CAISSON DISEASE.

From the New York Sun.

It has been said that a man never appreciates the joys of working until he has worked in a pneumatic caisson. It was once and perhaps is now a favorite experiment in the classes in physiology in a high school to place a mouse in a glass vessel and gradually to force in oxygen. A change would be seen immediately. The mouse would grow restless and run around in a crazy manner. When the air in the vessel was composed of an undue proportion of oxygen the mouse would race madly about until finally, if left long enough, it would sink down exhausted and die.

Similar to this, although less perceptible, is the effect of compressed air upon men working far below the surface of the ground in a caisson. Those who have had experience say that after the first few minutes a feeling of intense exhilaration came on them, a feeling of physical power and desire to do something. As is well known to those who have to do with caissons, a man working in compressed air does double the amount of work he would accomplish outdoors, and this, too, in a temperature that often rises to 100 degrees. The extra amount of oxygen he takes into his lungs is so exhilarating that the laziest man becomes a model workman.

But the case of a man working in compressed air differs from that of the mouse in the jar in that he is rarely killed, and that he feels no uncomfortable effects if proper caution is exercised. Owing to the fact that few of the men who work in caissons do exercise proper care and caution, they are often afflicted with an intensely painful and sometimes mortal illness, which has come to be known as the "caisson disease." During the last two years the "pathology of compressed air" has occupied the attention of many medical men, and considerable has been written about it. The caisson disease especially has engrossed the attention of many, and some interesting discoveries have been made concerning it. The common use of caissons nowadays, not only in building foundations for bridge piers, but also for foundations of great buildings, has given unusual opportunities for the study of the disease.

A caisson is nothing but a huge inverted box of timber or of steel. Its dimensions vary. The interior of the box, or caisson,

is called the working chamber. The top is called the deck. This is of great thickness, the decks of the Brooklyn Bridge caissons being twenty-two feet thick. The sides of the caissons are called the cutting edges, or shoes. When it is necessary to go down below the water line to secure a solid foundation the caisson is brought into use. An excavation is made to the water line usually, and the caisson is set on the ground with the edges down. Then it is filled with compressed air, the object being to hold back the water from the chambers so that men may work below the surface of the water. Air is pumped into the chamber through a pipe coming from the compressors, and a pressure is maintained equal to or a little more than the pressure due to the depth of water. Approximately, one pound of air pressure equals the pressure caused by a depth of two and three-tenths feet of water. Access to the working chamber is obtained by means of a long steel tube which goes through the deck and is surmounted with an air lock, operated on a principle similar to that used in the operation of ordinary canal locks. Near the top of the tube is a floor in which is a trap door. Seven or eight feet above this is a similar floor with a similar trap door. One of these doors is always kept open. When the lock is in, the lower door is open and the pressure is the same as in the working chamber below. When the lock is out, the upper door is open, and the pressure is that of the atmosphere. When a man is going into the chamber he holds closed the top trap door and opens suddenly a valve in the bottom door to get enough pressure in the lock to hold the top door shut. Then the valve in the lower trap is closed again and opened little by little, in order that the pressure in the chamber may become the same as that below, without shock to the man who has entered. When one leaves the caisson the operation is reversed.

The method of sinking a caisson is simple. When the air pressure has been applied the men enter the working chamber and begin to excavate further. The material taken out, if fine, is blown out by air pressure through a tube that goes through the deck of the caisson; if the material is coarse, it is hoisted in buckets through a steel shaft at the top of which is an excavating lock similar in principle to the man lock. As the material is excavated the caison sinks, and brick, concrete or stone work is built on the caisson deck as the sinking proceeds. The caisson, of course, is heavily braced where timber walls are used. The process goes on until the caisson reaches the rock or other solid, and then the working

chamber is filled with concrete. Finally the shafts and tubes are filled, and thus a solid column of masonry is procured from the solid foundation to a point above the water line.

Among the men who do the caisson work described are found the victims of the caisson disease. The forms of this disease are varied, and for a long time after caissons came into use medical authorities, although attributing it in general to the effects of compressed air, were unable to trace exactly its causes, and it has been only within comparatively recent years that they have solved the problem to their own satisfaction.

The most noticeable thing about a man who has just been exposed to compressed air is his deathly pallor. His face appears absolutely bloodless. This is because the pressure of the air drives the blood from the surface to the interior of blood vessels. Those interior blood vessels which are surrounded by soft tissue are subjected to an exterior pressure from the air, as well as to an interior pressure of the blood forced into them, and the pressure being thus equalized, they remain comparatively unchanged. But with the vessels inclosed in a bony structure it is different. These are not subjected to the equalizing exterior pressure as are the vessels in soft tissue, and they therefore become enormously distended.

No ill effects from this disturbance manifest themselves until a change is made from compressed air to the normal atmosphere. Then the blood, endeavoring to resume its normal circulation, becomes clotted in the distended vessels, and the nerves there are affected. The spinal column is particularly sensitive to the effects of air pressure. Any portion of the spinal column affected by this clotted blood transmits the disturbance or irritation to those parts of the body whose nerves terminate in the affected part of the spine, and as a result the caisson disease may manifest itself in any or all parts of the body.

In the most painful, but less dangerous forms of the disease these manifestations produce acute pains, particularly in the limbs and those parts of the body where the bony structure predominates. This form of the disease is called by pressure men the bends. This term originated when the Eads bridge was building across the Mississippi at St. Louis. At that time women affected an abomination known as the Grecian bend, an awkward stoop accentuated by a huge bustle. It was thought that the contortions and doubling up of the men in paroxysms of pain resembled the feminine attitude prescribed by the fashion of the time. The pains

are somewhat similar to those of rheumatism. They are agonizing in their intensity. It is impossible for a man suffering a bad attack to get rest, as the only alleviation comes from motion, and it is often impossible to take enough morphine within the limits of safety to induce sleep.

It is a rather peculiar feature of the disease that the pain from the bends disappears as soon as the sufferer enters the chamber filled with compressed air; he then is as fit to work as a well man. But as soon as he returns to the normal atmosphere they return, although without increased violence. This, however, is a mild form of the disease, although the commonest. Occasionally the disturbance along the spine is so great that paralysis ensues in some parts of the body. Occasionally the paralysis, especially in the limbs, is permanent. The paralysis may extend to a vital organ. There are cases in which death has been almost instantaneous upon exit from the caisson.

Congestion of the brain is another form of the malady. The other form is extravasation of the blood, caused by the local effect of the disturbance upon the circulating system.

The bends are never mortal, nor are their effects permanent. A man with proper care can recover fully in two or three weeks. Wherever caissons are sunk certain remedies are kept on hand to relieve the men taken sick. The two principal remedies are morphine and ergot of rye, the first to deaden the pain and the second to produce a contraction of the blood vessels. Ergot of rye must be used sparingly on account of the danger of its producing gangrene in the feet. It is customary, also, to use an electric battery and hot baths and rubbing, but while the men have great faith in these remedies, the utility of them is doubted by medical specialists. A man who has the bends suffers terrible pain, but he has the consolation of knowing that with it he cannot have the more dangerous form of the caisson disease.

It is, of course, to the interest of the companies and contractors to take as much care of their men as is possible, and elaborate precautions are adopted to ward off the malady. But more often than not these precautions come to naught through the carelessness of the men. Wherever a caisson is being sunk there will be found near it a little shanty that contains a boiler and enough steam pipes to keep the temperature up to about 100 degrees. This shanty is called the warming house, and men coming out of a caisson are hurried into it. They are required to strip off their cloth-

ing and take hot baths and after rubdowns with rough towels they are advised to put on clean, dry clothing and lie still half an hour.

The most important precaution should be taken when a man is passing from the compressed air into the atmosphere. Engineer Collingwood of the Brooklyn Bridge made a rule that a man coming out of a caisson should stay in the airlock five minutes for every fifteen pounds of pressure. When a man is in the lock pressure is reduced gradually by allowing the air to escape through the top trap. Few companies, however, abide strictly by such a rule, regarding a shorter time in the airlock as sufficient. A large engineering firm in this city has an elaborate set of rules for the guidance of their caisson employees. No men who have heart trouble or are subject to epileptic attacks or are particularly stout are employed by this firm. In coming from or going to the caisson the men are directed to go directly to the warming house or from it. The warming house should not be left, say the rules, before the foreman gives notice that the caisson is ready. After entering the warming house men should be careful to keep out of draughts. If a man, on coming from a caisson, feels a slight gripping sensation, which means the bends, he should lie down as near the stove as possible, cover himself with sufficient clothes to produce a perspiration, and have hot applications placed on the parts affected. Half an hour, at least, should be passed in the warming house after one has left the caisson, during which time one should bathe in hot water, rub himself well, and put on dry clothes. No liquor may be drunk before one enters the caisson or during working hours, nor should a man go down with an empty stomach. Plenty of meat should be eaten. Warm coffee should be drunk before going down. At least eight hours of sleep must be had in the night, and it is most important that the bowels be kept in order. After working in heavy pressure men should lie down for at least an hour after coming out, and, finally, they should never enter a caisson when feeling at all unwell.

These rules are based on Collingwood's rules, made for the men working on the Brooklyn Bridge caissons, but now modified to suit more recent experiences. If the men minded them there would be no reason why they should not live to ripe old age, working six days a week in a caisson. But unfortunately, like most men engaged in hazardous work, the caisson workers are often dissipated, and the bends usually overtakes them.

As to the amount of pressure a man can stand, "Cassier's Magazine" said recently:

"Anent the recently mooted question as to the greatest air pressure men can stand in caisson work, Messrs. Sooysmith & Co. of New York, who for years have made a specialty of difficult foundations and tunneling, requiring the use of compressed air, tell us that the full ability of properly equipped and properly behaved men, under the most favorable conditions, to resist caisson disease, has never been tested. The highest working pressures recorded have been close to fifty pounds per square inch, but with extreme care in the selection of men and a corresponding care on the part of the men it is very probable that this limit may be considerably exceeded. For the average man under ordinary conditions the top limit may be placed at about forty-five pounds, the time of working varying from four to six hours a shift, according to conditions. In cases where higher pressures might be used the shifts for the men should be restricted to two of two hours each, separated by a considerable interval.

"The character of the material through which the caisson is being sunk, or upon which it may be resting at any time, bears quite largely upon the ability of the men to stand the pressure necessary to hold back the water at that point. If the material be so porous as to permit a considerable leakage of air through it, there will naturally result a continuous change of air and a corresponding relief of the men from the deleterious effects which are produced nearly always by over-used air; in other words, ventilation is kept up by the porous material.

"On the other hand, if the caisson is passing through an impervious substance, such as tough clay, consequent bad effects on the men are very noticeable. As it is usually necessary to carry the highest pressure when the caisson has reached its final position and while the air chamber is being filled with concrete and being sealed up, the worst effects usually result at this time; thus very often when the pressure is greatest the ventilation is worst. * * * The physical condition of the men is a very important factor in the whole matter. Men who are thoroughly sound organically and who are not fleshy can endure much higher pressures than men who have not these physical conditions."

Brief mention may be made of other effects of compressed air that do not constitute caisson disease. These effects are noticeable in the cavities of the head. The aural cavities are affected often.

On entering compressed air it is necessary that a man have on the ear drum an interior pressure equal to the exterior. This increased pressure is secured by the outlet of air through the eustachian tube. If this is free there is no difficulty, but if it is clogged, air can be forced into it by holding the nose and trying to force air through. When this cannot be done plugging of the ear ensues, either the ear drum is broken, or a blood vessel in the ear bursts and deafness results. Then, too, if a man has catarrh or a cold the air will not enter readily the cavities back of the nose, the maxilary sinuses, and those above the eye, the frontal sinuses. In this case return to the normal atmosphere brings on intense pain until equilibrium is restored. The slow entrance of the air does not seem painful, but the slow exit is extremely so. Often the air in the maxilary sinuses leaks out around the eye teeth, separating the gums from the teeth.

To illustrate the care taken of caisson workmen, mention may be made of the compressed-air hospital once used in the Hudson River tunnel. The hospital consisted of a huge cylinder fitted with couches and thick bullseye windows. The air was kept at a pressure equal to that of the caisson. When a man came out of the caisson showing the slightest signs of the disease he was hurried into the hospital and kept there under medical treatment for several hours. Then the air was let out very gradually, two hours sometimes being consumed in the operation, until the pressure of normal atmosphere was reached. Then the patient was released.

THE STUDY OF CRIME AND DEGENERATION FROM A MEDICAL STANDPOINT.*

By Willis S. Anderson, M. D., Detroit, Mich.

My object in presenting this paper is not to offer anything distinctly new or to favor any preconceived theory; but rather to bring together certain facts from various sources and to draw such conclusions as the facts would seem to warrant.

We must assume for the purpose of our study that mental acts have a physical basis.

Since the days of Ferrier, whose experiments confirmed the works of Fritsch and Hitzig, of Berlin, the localization of brain

* Read by title before the Michigan State Medical Society, at Mount Clemens.

functions has been well established. It has come gradually to be acknowledged, with the accumulated evidence derived from the study of the lower animals and man, both in health and disease, that all of our mental acts have a physical basis, in the sense that mentality is accompanied by a chemical change and a structural rearrangement of the molecules of the nerve cells. Hodges, in the study of fatigue, found an actual change in the brain cells following activity, that disappeared after a period of rest.

There are some who do not believe in this newer physiology; but the evidence derived from competent observers seems to warrant us in accepting this doctrine as the most rational explanation. It was formerly believed that our passions, such as hatred, love, fear, and the like, as well as reason, were confined to man; but the study of the works of Romanes, Lubbock, Darwin and many others, convinces us that these qualities are common to the lower animals.

It is now generally accepted that the mental acts of animals, children and adults differ not in kind but only in degree; that the same laws that govern our minds govern those of animals; and that similar chemical and molecular changes take place in the brains of both men and animals. If these facts are true, the study of crime and degeneration has a new interest; and much can be gleaned from the psychological study of animals and man.

The study of criminals and degenerates has been mainly along two lines: first, the somatic or bodily anomalies; second, the psychological peculiarities. Lombroso was the first scientist systematically to study the physical peculiarities of degenerates, and his tabulations of the various measurements of criminals and the insane form an interesting study.

It would seem from the study of the writing of the Italian school that abnormalities in general, and those of the head in particular, were more common in criminals than in normal individuals. The cephalic indices are greater, the prognathous jaw, and the atypical or projecting ears more common than in the normal

The committee appointed by the British Medical Association to investigate the development and condition of the mind among school children found that ear defects were frequently associated with nerve defects and mental weakness. Dr. Langdon Down finds a resemblance between feeble-minded children and the various ethnic types of the human family, especially the Mongolian and Negroid.

However attractive statistics and measurements may be, we must not forget the importance of racial characteristics, the effect of diseases both prenatal and postnatal on the physical development of the individual. It is also important to remember that apparently normal persons may frequently have one or more of these degenerative marks. It would seem that one is justified in concluding, after taking all facts into consideration, and from the study of a large number of cases, that the criminal, the insane, the idiot, and the feeble-minded have physical anomalies oftener and more highly developed than normal individuals.

The more recent studies of criminology have been along a psychological line, rather than by the observation of the purely physical anomalies. It is as impossible to define sharply the limits between a normal and an insane or a criminal person as it is to understand accurately the difference between the diseased and the healthy action of cells.

As Max Nordau says: "The difference between disease and health is not one of kind, but of quality. There is only one kind of vital activity of the cells and of the cell systems or organs. It is the same in disease and in health. It is sometimes accelerated and sometimes retarded, and when this deviation from the rule is detrimental to the ends of the whole organism, we call it disease."

So it may be said with criminals, it is impossible to define the limits separating normal from degenerate persons. All mental processes are governed by the same laws, and all of us have at some time in our existence criminal tendencies; but it is only when our evil propensities become detrimental to the community in which we live that we are considered criminal.

Let us consider the evolution of crime, in order that we may rid ourselves of the idea that those acts which we are accustomed to call criminal are confined to the human species. Animals low in the scale of life are prone to commit such criminal acts as infanticide, murder and thieving. Snakes very often devour their young. Lubbock cites instances where bees and ants kill those of other species for the purpose of robbery. Romanes, in his "Animal Intelligence," gives any number of instances of crime committed by animals. Speaking of a certain species of ants, he says, judging from experiments, it would seem that hatred was a stronger passion than affection, while in other species sympathy and affection seem to be more highly developed. Audubon is reported as having observed the thieving propensities of birds. Many species are

habitual thieves and often secrete articles apparently of no value to themselves. The tendency to steal and to hide things is one of the strongest traits of the wolverine. Rats, mice, wolves, rabbits and birds have been seen to kill those of their own species. Dogs have been known to slip their collars, and go miles to kill sheep, then wash the blood from their bodies in a stream, return before daylight and slip on their collars. Monkeys many times will kill their young, when tired of carrying them. They are also fond of deception and are great thieves. Many animals develop uncontrollable passions, and while infuriated often kill those of their own species or even family.

While these facts and many others have been observed, it is true that the maternal instinct is highly developed in animals, and that affection is so strong in some that they will die for or in defense of their own species, and in some instances those of other species. Though some of the acts mentioned may have been done in self-defense or self-preservation, there are many apparently purposeless acts against the natural instincts of animals, that may surely be classed as morbid.

Turning our attention to the uncivilized races of men, we find crime especially frequent. The primitive tribes, as a rule, place but little value on human life, especially on those of women and children. Wood, in his "History of the Uncivilized Races of the World," cites any number of instances to show the criminal tendencies of the savage. Some of their crimes are associated with their religious or superstitious beliefs; but many seem to be the natural result of unrestrained animal passions. I have been told by one living among our American Indians in Idaho, that infanticide is common.

The study of childhood offers much that is of practical as well as of scientific interest. The psychology of children occupies a middle ground between that of the lower animals and the adult man. It may not be pleasant to some to associate our babies with the lower animals; but it is, nevertheless, true that a close study of human embryology and the psychology of childhood teaches us that there are definite relations between the workings of the animal and infant mind. An infant at birth has its animal instincts highly developed, and in gesture, mimicry, and instinctive movements bears a close resemblance to the monkey. As the minds of children gradually develop, those qualities which are prominent in criminals and degenerates are the first to evolve. The idea of self

enters more largely into all their acts than in normal adults. The emotions of the child are more easily aroused and less under the control of the will than in later life. Attempts to injure those around them are very common during fits of anger. Petty thieving of tempting morsels, of playthings and of similar articles, and the practice of lying are common, even among carefully trained children. Capital crimes are not unknown among children. Murder and assaults have been reported many times. Children have a very imperfect idea of ownership and responsibility. Deceit, vanity, pride, superstition and cruelty are common traits in early life. These qualities, so undesirable in adults, are usual in children; and an exaggeration of these very traits in criminals marks them as vicious members of the community.

Idiocy, feeble-mindedness and epilepsy are accompanied by mental impairment, and often lead to crime and acts of violence. These affections may be due to congenital defect, to injuries, or to disease. Emotional instability is common among criminals, and often develops while they are secluded in prison. They frequently have periodic explosions that resemble epilepsy and which, like that disease, are more frequent in hot weather. One observer states that four per cent. of the criminals under his care were subject to violent fits of passion; among women these attacks are more common during the menstrual period.

Lombroso has pointed out that those regions in Italy that produce the most epileptics also produce the largest number of criminals. The relation between insanity and crime is an important one, although too large a subject to be considered in a paper of this kind. Those crimes that lead most often to insanity are potent agents in the production of crime. For instance, syphilis, alcoholism and sexual excesses are responsible for much of our insanity and our crime.

Jacobi says: "The constitutional criminal is a tainted individual and has the same relation as the epileptic to convulsions. The essential reason of abnormal brain action is abnormal brain structure." Later he says: "There is no especial type of insanity or of criminality. There is but one thing fixed, that is, the relation of cause and effect, the correlation of physical causes, and mental and moral symptoms."

Lombroso, in his "Men of Genius," and Nordau, in his "Degeneration," give any number of examples of excessive nervous and mental action in men and women who have been prominent in

their respective fields of activity. While it is true that Nordau has exaggerated the condition, it is, nevertheless, a fact that the history of poetry, art, music and literature is filled with examples of men and women who bore distinct marks of degeneration. Many inherited insane tendencies, some succumbed by reason of disease, overwork or dissipation. According to one authority, insanity is forty times more frequent among criminal than among average men and women.

We can trace in all individuals a process of evolution in the building up of their natures. Animal instincts are highly developed at birth, next intellectual power is added, and finally moral and ethical conceptions help to round out a man's character.

That it is possible to have arrest of development during any stage is apparent, just as there may be arrest of development during the embryonic stage, leading to congenital anomalies. If the process of evolution is checked in early childhood, only the animal instincts exist, and idiots and imbeciles are the result. If the arrest takes place later, we have impaired mental power or feeble-mindedness. If the arrest or atrophy is postponed until manhood is reached, we may have intelligence, but no moral sense. There are in society to-day many moral imbeciles, whose intelligence disguises them from the world until they commit some heinous crime that reveals their true character to society.

Heredity exerts a marked influence in the production of criminals. Just as physical and mental peculiarities are transmitted from parent to offspring, so moral and criminal tendencies are, likewise, inherited by children of degenerate parents. Some would explain these apparent transmissions of criminal tendencies to environment, but after considering all points, there seems to be no doubt that criminal tendencies are actually transmitted. We do not mean by hereditary transmissions of criminal tendencies that parents must have been actual criminals in a legal sense, or that the children are; but that the inebriate, the epileptic, the insane, the morally depraved beget children that are deficient morally and are prone to drift into criminal life, without regard to environment.

The Jukes family, as studied by Dugdale, is an excellent illustration of the influence of heredity. From the head of the family, Max Jukes, a great drunkard, descended, in seventy-five years, 200 thieves and murderers, 280 invalids attacked by blindness, idiocy or consumption, 90 prostitutes and 300 children who died

prematurely. Out of 709 descendants carefully studied, but few were honest. Of the men, not more than 20 were skilled workmen and 10 of these learned their trade in prison.

It has been observed that criminality, like idiocy, tends to run in the line of the eldest sons. Morris gives instances where, for four generations, marks of degeneracy were plainly evident, and with the fourth generation the race became extinct. He also points out the tendency to degeneracy in children of intemperate parents.

It would be interesting to study more in detail the influence of such diseases as syphilis, tuberculosis, alcoholism and meningitis in the production of abnormal conduct. That these and many other affections are important can hardly be doubted after studying carefully the histories of many criminals, who, either by inheritance or from acquired disease, have dyscrasiae, which enfeeble them physically and render unstable their nervous systems. We must not infer from this study that criminals and degenerates can be arranged like pathological specimens in a museum, each labeled as a distinct morbid entity, with a proper diagnosis, and all dependent upon actual disease. We must remember that environment, education, association and climate bear an important relation to vicious conduct; and it is only by weighing these various factors in each individual case that a scientific diagnosis can be made.

The conception of crime on the part of many reminds one of those days of superstition and ignorance when those affected with insanity, epilepsy, chorea and similar diseases were considered to be bewitched by the devil, and therefore were cast into prison, hanged, and even burned at the stake. The history of witchcraft in our country is a blot upon old New England. To-day all is changed. We have asylums for the insane, colonies for the epileptics and homes for the feeble-minded, while the aim is to reclaim these unfortunates and to return them as useful members of society.

From our experience in the past in dealing with those mentally impaired, and from our present knowledge of the normal and diseased workings of the brain, can we not apply similar methods to the study and care of criminals and degenerates?

This problem is of vast importance to society and the State; and it behooves the medical profession to give the same study and thought to it as they would give to mental diseases in general. It is necessary that we keep in touch with this problem in order that we may give an intelligent opinion and wisely direct legislation along lines that are practical, scientific and just.—"The Physician and Surgeon," August, 1896.

DEPARTMENT OF PUBLIC HEALTH.

The following is the action of the Pan-American Medical Congress, and Senate Bill No. 3,652, introduced by Senator Gallinger, referred to in the March number:

REPORT OF COMMITTEE OF THE FIRST PAN-AMERICAN MEDICAL CONGRESS ON DEPARTMENT OF PUBLIC HEALTH FOR THE UNITED STATES.

Mr. President and Fellow-Members of the Second Pan-American Medical Congress:

I have the honor to make the following report from the Committee on Department of Public Health for the United States:

The First Pan-American Medical Congress, in general session at Washington, D. C., September 8, 1893, unanimously adopted the report of the International Executive Committee, which embraced the following, viz.:

Resolved, That in conformity to general regulation 5, the International Executive Committee hereby authorizes the appointment of the following international American committee, viz., * * * under which resolution, among others, a Committee on Department of Public Health was appointed, whose duties were defined as follows:

"*Committee on Department of Public Health.*—A committee consisting of one member from each constituent county or colony, whose duty it shall be to co-operate with the object of placing the care of the public health in charge of experienced and educated medical men, and to secure the establishment in each of the several governments of a Department of Public Health, with parity of voice and influence in national and colonial councils and with independent executive authority under limitations common to other departments in the same government. Each member of this committee may, at his discernment, appoint such coadjutors resident in his respective county or colony as may be required to carry out the purpose of this committee."

The International Executive Committee under the following resolution—

Resolved, That the *ex officio* President of the International Executive Committee shall appoint the president of each of the foregoing committees from among those appointed as members of the same, and that the president of each committee shall appoint the secretary of his respective committee from among either the members or the coadjutors of the same—

appointed Dr. Henry L. E. Johnson of Washington, D. C., presi-

dent of this committee, and he, with authority duly invested, appointed Dr. William Pepper of Philadelphia, Pa., and Dr. Charles A. L. Reed of Cincinnati, Ohio, coadjutors to the said committee, and Dr. H. L. E. Johnson of Washington, D. C., secretary *pro tempore.*

In conformity with the fifth resolution covering the special committee, which says: "The president of each committee shall prepare a final report of the detailed work of his respective committee and submit the same to the Second Pan-American Medical Congress," the president, on behalf of the committee, makes the following report:

We recommend the adoption of the following draft of a bill to be made a law by the Congress of the United States, to wit:

A BILL TO ESTABLISH A DEPARTMENT OF PUBLIC HEALTH.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, There shall be established a Department of Public Health. There shall be appointed by the President from the medical profession, by and with the advice and consent of the Senate, a Secretary of Public Health, who shall be intrusted with the management of the department herein established. He shall be paid an annual salary of $8,000. There shall be appointed by the President, with the approval of the Senate, an Assistant Secretary of Public Health, at an annual salary of $5,000. The Secretary of Public Health shall, with the approval of the President, provide suitable offices for the department, and shall employ such assistants and clerks as may be necessary.

SEC. 2. That it shall be the duty of the Secretary of Public Health to obtain through all accessible sources, including State boards of health, municipal authorities, and the Surgeons-General of the Army, Navy, and Marine Hospital Service of the United States, weekly reports of the sanitary condition of all ports and places within their territories and departments, and he shall publish weekly abstracts of the information thus obtained and other pertinent matters received by his department. The said department also shall, as far as possible, by means of the voluntary cooperation of State and municipal authorities, of various general and special hospitals, sanitariums, public associations and private persons, procure and tabulate statistics of marriages, births (noting those that are illegitimate), stillbirths, with cause thereof, and period of utero-gestation, and deaths from epidemic, endemic and all other diseases, specifying those of a degenerative character, such as malignant growths and affections of the nervous, circulatory, respiratory, secretory, digestive and reproductive organs, and from violence, accident, suicide, murder, and data concerning the fruit of consanguineous marriages and the transmissibility of in-

sane, alcoholic, syphilitic, nervous and malignant types of constitution to offspring, and to evils of race miscegenations. He shall also procure information relating to climatic and other conditions beneficial to health, and especially in reference to the most favorable regions of the United States for the relief and cure of chronic diseases, particularly consumption. He shall also procure information as to the prevalence and ruinous effects upon the body and mind of intemperance and prostitution. He shall endeavor to ascertain the extent, the origin and classification of insanity in the several States and Territories of the country. He shall investigate the state of comfort of the laboring classes in respect to their lodgment, their trades, occupations, the healthfulness of their workshops and the contents of the atmosphere they habitually breathe, and the prevalence of premature degeneration of the nervous and muscular system by the exactions of piecework employment. He shall obtain information in regard to the soundness of their food and purity of water supply. He shall ascertain the ages at which the children of the poor are put to work and its hindrances to their physical development, and their lack of common school education. He shall seek, through the State boards of health, information of the hygienic state of public school buildings respecting their illumination, ventilation and presence of noxious elements in the circumambient air. He shall seek information in regard to the pollution of streams and navigable waters and public and private wells. He shall attempt, through the co-operation of the authorized medical schools in all States, to promote the most extended and thorough training of students in order to fit them for the responsible duties that devolve upon practitioners of medicine. He shall, whenever an epidemic disease is spreading abroad, or in any country which by commercial or other relation may endanger the health of the inhabitants of the United States, have power to call a conference of the Surgeons-General of the Army, Navy, and Marine-Hospital Service and the executive officer or officers of the various State boards of health throughout the country to consider and advise with him in regard to the best methods to pursue to protect the country against the invasion of any such epidemic disease, and the results of such conference shall be, by the Secretary of Public Health, communicated to the President and his Cabinet for such action as they may deem wise and expedient. Besides the reports of the state of the public health which he shall make from time to time, the Secretary shall make an annual report to Congress, with such recommendations as he may deem important to the public welfare, and the report, if ordered printed by Congress, shall be done under direction of the department. The necessary printing of the department shall be done at the Government Printing Office, upon the requisition of the Secretary, and in the same manner and subject to the same provisions as that of other printing for the several departments of the government.

SEC. 3. That the President is authorized, when requested by

the Secretary of Public Health, and when the same can be done without prejudice to the public service, to detail officers from the several departments of the government for temporary duty, to act under the Department of Public Health, to carry out the provisions of this act, and such officers shall receive no additional compensation except for actual necessary expenses incurred in the performance of such duties. When a detail of such officers cannot be made, the Secretary, approved by the President, may employ such experts, and for such time and in such manner as the funds at the disposal of the department may warrant.

SEC. 4. That to defray the expenses in carrying out the provisions of this act, the sum of fifty thousand dollars, or so much thereof as may be necessary, is hereby appropriated, to be disbursed, with the approval of the President, under the Secretary of said department.

SEC. 5. That this act shall take effect sixty days after its passage, within which time the Secretary and Assistant Secretary may be appointed.

We further recommend—

The passage of uniform national and State laws regulating the importation, exportation, sale, inspection, and standard of meats, fruits and food stuffs, water supply, ice, milk, and beverages, prohibiting adulteration and providing adequate penalty for violation.

The passage of uniform laws, national and State, regulating the manufacture, importation, exportation, and sale of drugs and chemicals, with provision for their inspection, and penalties for their adulteration. And a further provision requiring the labeling with exact formula all proprietary medicines and compounds, and providing penalties for violation.

The passage of uniform laws, national and State, regulating the sanitation of railroad cars, both steam and street, barges and ships, steam and sail, public vehicles, ambulances, laundries, slaughterhouses, morgues, hospitals and dispensaries, jails and reformatory institutions, with penalties for violation.

The passage of uniform laws, national and State, regulating the hygienic management of contagious diseases, personal and house quarantine, vaccination, hygiene of dentistry, barber shops, public baths and gymnasiums, amusement halls, migration of tramps and profligate persons, disposal of dead bodies, garbage and sewage, draining of lands and removal of weeds and decaying vegetation, and providing penalties for violation.

The passage of uniform laws, national and State, providing for and regulating disinfecting plants, steam, dry heat and chemical, for mails, foreign and domestic, clothing, bedding, money, persons,

etc. Bacteriologic laboratories, animal industry and inspection plants, State and national hospitals, and retreats or sanitariums for the treatment of habitues, inebriates, venereal, tubercular and insane persons, with special laws for commitment to and discharge from the same. District nursing for the poor, sick, obstetrical, contagious diseases, etc.

The passage of uniform laws, national and State, providing for the appointment of State and national medical experts and the punishment of medical crimes.

The passage of uniform laws, national and State, regulating State and interstate medical, surgical and dental practice, which will protect the same as a science and not as a trade.

We further recommend adequate appropriation of money by the several States and the general government for the scientific investigation of public health matters in this and foreign countries, and the suppression of diseases, endemic and epidemic.

We further recommend that appointment to and the tenure of medical offices shall depend upon professional ability and efficiency, and not upon political influence.

Respectfully submitted,

HENRY L. E. JOHNSON, M. D., Washington, D. C.
President Committee on Department of Public Health.
WILLIAM PEPPER, M. D.,
CHARLES A. L. REED, M. D.,
Coadjutors.

MEDICAL EXCERPT.

BY T. P. CORBALLY, A. M., M. D.

INFECTIOUS ERYTHEMA.—M. L. Galliard presented to the Société Médicale des Hopitaux, "La France Médicale," 12th March, the report of a case of erythema complicating an inflammation of the mucus membrane of the colon, in a boy five years old. The colitis did not, in this case, have the tendency to degenerate into the chronic form, as it does usually in such cases in the adult. It lasted only ten days, remained through its course without fever, and was visibly decreasing when, instead of the convalescence naturally expected, an aggravation of the disease became manifest. High fever was suddenly developed, a papulous erythema, located at first in the face, then in the folds of the elbows and on the back of the wrists; it soon became generalized, diffuse, in the parts first attacked, as the neck, the arm-pits, on the hips and the legs; eruptions on the chest, the back and the abdomen resembling measles.

This erythema was accompanied by high fever, 104°, which rendered cold baths necessary, and calomel was freely given as an antiseptic for the intestines, and a weak solution of borax was used as an injection for the colon.

The eruption grew paler on the fifth day, and disappeared entirely on the ninth. The desquamation began on the face, the cuticle was thrown off in large flakes on the extremities; it ceased about the end of the fourth week. Albuminuria was found only on the second day. The ganglionic system was not congested. There was no visceral complications. The recovery was complete.

The examination of the mucous discharged from the intestines showed the presence of the coli-bacillus only. It was to the presence of the coli-bacillus, then, that the erythema must be attributed. In every respect, the disease was exactly similar to the erythema observed by the author in typhoid fever.

APPENDICITIS.—M. Reclus made a very important report to the Académie de Médicine, "Gazette Hebdomadaire," 21st March, on the pathogenic conditions of appendicitis, in which he differs very decidedly from the theory of a closed sac advocated by M. Dieulafoy.

He thinks the appendicitis may result from three distinct causes: 1. From the presence of foreign bodies in the appendix. 2. From inflammation of the neighboring tissues, as from enteritis, enterocolitis, intestinal lithiasis, etc; and, 3, from a condition of general infection.

He also adds that, in his opinion, the gravity of the disease depends much on the peculiar conformation of the organ. The result of his observation is, that the inflammation of the appendix is the consequence of several different affections, and that the disease is the result of the peculiar conformation of the organ and of its relations with the surrounding tissues.

At the same time that M. Reclus presented his report to the Académie, M. Josué made his communication to the Société de Biologie of his later experiments on this subject, which is now engaging the attention of the clinical reports in all the societies.

M. Josué reports that he can reproduce all the lesions of appendicitis by the intravenous inoculation of the cultures of streptobacillus as prepared by M. Charrin in the cases of appendicitis that prevailed so extensively among the rabbits in the laboratory. On the other hand, he observed similar lesions in a rabbit that died, three days after the injection of the contents of the intestines into

the veins. In none of these cases was the disease caused by local action, by traumatism, nor by any other procedure.

At the autopsy, the appendix was tumefied; it had, on its surface, a great number of white nodules rising up under the peritoneum, formed by close folicles which were very much increased in size. The channel of the canal was very much diminished, in consequence of the thickening of the walls; it contained large masses of a substance that very much resembled mucous, and was transparent. The large glands of Peyer, which are found at the termination of the ileum of the rabbit, presented lesions, perfectly analogous to those of appendicitis. The peritoneum was healthy, there was neither false membrane nor adhesions.

The results of these experiments seem to furnish new arguments for the opponents of the theory of appendicitis as the result of a closed sac. The author thinks that these facts also prove, that the origin of appendicitis is not limited to any one cause; it may arise from many. The two theories account for the real facts, but neither is sufficient, when taken alone, to account for the origin of the disease in all cases.

The appendix is a lymphoid organ susceptible of undergoing various changes as the result of different affections. The germs enter the folicles through the agency of the blood; this has been proved by our experiments; on the other hand, it is not illogical to admit that they can penetrate into these organs through the superficial layers of the mucous or through the lymphatics.

Finally, certain toxic conditions are not without influence on the lymphatic membrane of the appendix. Besides, certain hemorrhagic changes of the mucous of the appendix had previously been pointed out incidentally by Roger, in infection of the bacillus of Friedlander and in phosphoric poisoning. This form is characterized by swelling of the entire organ and especially of the closed folicles which sometimes become the seat of abscesses or ulcers.

The inflammation of the appendix may be complicated, at any moment, by a special accident; that is the obliteration of the canal, which is so small in the human subject, sometimes in an unusual manner, in consequence of the swelling of the mucous, sometimes, at a later period, by a coarctation, or by a calculus which may be the consequence of a chronic inflammation. The appendix once transformed into a closed sac, pus is soon formed in the cavity; this suppurating sac often causes peritoneal lesions in the neighborhood, and it may open spontaneously or it may result in gangrene.

BACTERIOLOGY IN SCARLATINA.—MM. Mery and Lorrain have reported to the Société de Biologie, "Le Progrès Médical," 27th February, their bacteriological observations in different cases of scarlatina, in which they examined the exudations of the throat, the urine, the blood, intercurrent abscesses, and have found the presence of seven varieties of streptococci, six of which were not influenced by the serum of Marmoreck, to the extent that rabbits inoculated with cultures of the streptococcus, and with the serum, died before the rabbits to which no disinfecting agent had been administered.

BACTERIOLOGICAL RESEARCHES ON MEASLES.—M. H. Barbier reported that he had examined the blood of the mucous membrane of the conjunctiva, the nose and the mouth, as well as of several complications, in a great number of cases of measles, and reports the following results of his observations.

1. The Blood. In 11 patients he found the blood, taken from the immediate neighborhood of red spots was sterile in 7, and in 4 cases he met the parasites peculiar to the skin.

2. The Conjunctiva. In 57 cases examined, there were 6 negative results and 31 positive.

In these 31 cases he found:

(*a.*) A bacillus resembling in its morphological characteristics the bacillus of diphtheria, but differing from it in its forms of involution, appearing from the third day in gigantic form, pear shaped, club-like and terminating like a comet, it reminds sometimes of a large comma terminating in points; the tenth day the same appearance, but the object is filled with fine granulations, slightly colored. It has no virulence whatever. He found it 16 times in cases of measles; he found it also in other cases, but very rarely.

(*b.*) The white staphylococus was found 13 times in 37 cases.

(*c.*) Other micro-organisms. The streptococus was rare. The cocci, diplococci and the bacilli were also found.

3. The Bucco-pharyngeal and Nasal Mucuous. The manifestations are very complex.; 9 times in 12 he found the streptococus, then the pneumococus, the white staphylococus, and also the bacillus already referred to above.

4. In complications of the conjunctiva nose and pharynx, septic microbes are specially met with alone, or associated with the same bacillus. The white staphylococus is among those met with most frequently.

THE INFLUENCE OF BACILLI VARIES WITH AGE.—MM. Teissier and Guinard, of Lyons, have found, "Le Progrès Médical," 27th February, that the action of the bacillary toxines varies with their age. When fresh, they usually cause an extravasation of blood. When older, they act especially on the nervous system, and cause chronic lesions.

M. Charrin recalls the fact that he insisted, in his work on the toxines, on the chronic nervous effects of the toxines, and that he has given a summary of these effects on hemorrhages, when showing the action of the toxines on the vascular walls, on the elements of the blood and on the chemical constituents of the serum.

ICHTHYOL IN DISEASES OF THE EYE.—Panas reports, "Medicinische Monatschrift," that ichthyol in inflammatory conditions of the eye has been successfully employed, either in aqueous solution, 50 to 30 per cent., or as a salve, 2½ to 5 per cent., with vaseline. In conjunctivities of all kinds, catarrhal affections, either acute or chronic, phlyctenular, or folicular, and in blepharitis, Panas has found it most useful. In the blenorrhagic ophthalmia of infants, in which nitrate of silver has been the principal remedy, ichthyol has given very satisfactory results. According to the report, it acts on the inflamed tissue by constricting the vaso-motor system, and it has in addition a remarkable influence in relieving pain; it is very serviceable, on account of its astringent properties, in relieving the excessive secretions, and, according to Panas, it helps to clear up the cornea.

The aqueous solution is best applied with a pencil; any pain that may sometimes follow lasts only a few seconds; at most a minute or more; this is followed by great relief to the patient.

The translator has used it in some cases of rheumatic swelling of the joints with great benefit to the patient.

PROTONUCLEIN is indicated, says Dr. Lucien Lofton, of Atlanta, Ga. ("Atlanta Clinic" for February), in all forms of wasting processes, anaemia, indigestion and in the various nerve affections, and as a general tonic and blood elaborator. Its now well recognized influence in coördinating the white blood corpuscle to its normal usefulness in the economy, bespeaks its place in scientific medicine. He cites several cases in which he used it, of which the following are examples: J. L., white, age sixty-seven, a sufferer from acute attacks of indigestion, with fainting spells accompanying the trouble. The various anti-dyspeptic remedies were tried at

times, but gave only moderate relief; the trouble, however, after a free purgation, would disappear. The patient eats almost anything with impunity now, and if the slightest uneasiness occurs as the result of undigested food, he takes a tablet of protonuclein, and experiences relief. It may here be stated his general health is daily improving.

Mrs. C. G., married, in her second pregnancy, some three months ago was a great sufferer from nausea and vomiting, with little or no appetite. She was given three-grain protonuclein tablets for three days, and is now experiencing first-class health.

LITHIASIS AND GOUT.—Dr. S. M. Ward, in an article entitled "A Preliminary Report on the Therapeutics of Lycetol" ("Daily Lancet" January 19, 1897), states: "No one more than the writer regrets the impossibility of his being able to more than indicate the uses, some of them, to which lycetol may be put advantageously, In the near future he hopes to be able to give more fully a detailed account of what this preparation has done. In lithiasis, in rheumatism, in gout, and in those little understood, vague and painful affections resembling neuralgia, though not following the nerve courses, lycetol is of use, is of value. One of my patients, for whom a well-known brand of lithia water had been prescribed with but indifferent results, was given the lycetol water and was benefited in a short time. My experience with piperazine has been limited, but I have used lycetol in that class of cases generally for which this drug would formerly have been prescribed."

ANTIFAT PATIENT.—Generally speaking, persons who seek treatment for being too fat, have good appetites, are healthy and strong. Their greatest need is exercise, but this they find harder to take than anything else. In illustration of their docile submission to treatment—not involving restraint—Dr. I. Zangwell, at a recent dinner of the Maccabees, told the following story: "The fat girl of C., gentlemen, is not a myth, nor a show person, but a solid private reality that I have seen. Her fatness weighed upon her, so she went to a physician to be rid of some of it. He drew up a careful dietary; she was to eat dry toast, plain boiled beef, etc., and to return in a month to report reduction. At the end of the month she could hardly get through the doctor's doorway. He was aghast. 'Did you eat what I told you?' he asked. 'Religiously.' His brow wrinkled itself. Suddenly he had a flash of inspiration. 'Anything else?' he asked. 'My ordinary meals.'"

EDITOR'S TABLE.

SANITARIAN, MAY NUMBER, 1897.

☞ ALL correspondence and exchanges and all publications for review should be addressed to the Editor, DR. A. N. BELL, Brooklyn, N. Y.

BROOKLYN'S WATER SUPPLY—HOW POLLUTED.

Filtration through sand and gravel has been long regarded as the most efficacious means of removing impurities from water supplies; but it must not be supposed that a filter bed thus composed acts as a mere strainer. Sand is of all agencies the most efficient in achieving the oxidation of organic matter suspended or in solution, either by the air contained in its interstices, or by the condensation of oxygen on its surface. While all finely divided solid substances have this power of condensing oxygen, sand possesses it in a superior degree. Hence, though charcoal and many other substances are more or less effective in this regard, all attempts to supersede sand by the use, or to improve upon it, by the addition of other substances, have proved futile.

The inimitable filter bed of the Brooklyn water supply has been frequently referred to in these pages, and two years ago, described in detail. Hence, with reference to recent conditions, it will suffice to cite the recognition of its excellence, coupled with its liability to danger from neglect, when it became the subject of sanitary supervision, nine years after it was first turned on (December 4, 1858), by the Metropolitan Board of Health.

"Brooklyn enjoys an exhaustless and excellent source of water supply, though its population should increase to a million or more, for both faces (the northward and the southward) of the long central ridge or axis of Long Island, constitute a vast filter bed of sand and gravel, through which the rainfalls slowly make their way to the living springs, which appear near either shore. But the most important of the natural causes of the *purity* of the water already requires to be specially guarded against one of the most insidious agents of disease—*we refer to the defilement of the rivulets in the vicinity of growing villages and cemeteries.* And this precaution is beginning to be a *sanitary necessity*, not only with regard to the great reservoir supplies for Brooklyn, but with regard also to the well water and other private and public supplies of the suburban

villages. Sanitary chemistry and timely work in engineering will be invaluable aids to protection of the public health in the growing population of Kings and Queens counties." (Report Metropolitan Board, 1867.)

But this admonition of thirty years ago appears to have been singularly short lived. It might go without saying that people who have traveled over Long Island with their eyes open are more or less disgustingly familiar with the apparent ignorance of some and the purblindness of other persons to the danger of water pollution. Surely no one *should be* more observant of such glaring dangers than the health authorities and water purveyors of Brooklyn. But their apparent faith in the cleansng power of the natural filter bed at their service, appears to have been so great as to render the exercise of their arts entirely unnecessary. Confessedly, they have known of the filthy condition of the reservoirs and ponds occasioned by the accumulation of vegetable matter and foul drainage in them, all along, but they seem to have wilfully incurred the responsibility of maintaining a standing menace to the public health out of respect for official comity.

Commissioner Emery warned the Mayor April 6 that with the approach of summer the polluted condition of the water should be regarded with grave consideration for the health of the city. That in a stretch of one and one-half miles of a feeder to one of the reservoirs, "there are 19 dwellings, 21 privy vaults, 14 stables, 15 sheds, six chicken pens, three pig pens and four buildings used in whole or in part for business purposes. These buildings are occupied by 108 people and 22 horses, three cows, eight pigs, and 225 chickens are kept upon the premises. All waste water, slops, etc., and drainage from the stables and pens run directly into the feeder by means of drains or indirectly into it over the surface."

This report brought out a counter statement from the Commissioners of City Works and Engineer De Varona, in charge, showing that both departments had long before known of this pollution, that the City Works Department had sought the co-operation of the Health Department and of the State Board of Health in February, in an effort to purchase this property, with a view to abating the nuisance. And next follows an explanation of the Counsel of the Department of Health: "You know there must be some feeling of comity between the city departments, and it was for this reason that the Commissioner held his silence until he was criticised for the condition of affairs. The trouble has been that the

City Works authorities do not seem to have appreciated the situation fully. They have been talking all along about the matter of cleansing the ponds when the real point at issue has been the foul surroundings to the feeders of the water supply. The filthy character of the places bordering on the feeder at the railroad track at Springfield and for 250 feet above that has *been known to all the authorities for a long time.* [Italicized by the Editor.] It has been a public disgrace. The Health Commissioner has done his duty in the premises, but it is really for the City Works officials to act."

COMPARISON OF HEALTH DEPARTMENTS—BROOKLYN AND BUFFALO.

Health Commissioner Wende, after a recent visit to Brooklyn (Buffalo "News," March 28) said: "I find that the work of the Buffalo Health Department is more appreciated by the members of the Brooklyn Health Department than by the people of this city. They have borrowed a number of our ideas, and while I was there a measure was pending in their Common Council for the adoption of an ordinance abolishing the long-neck nursing bottles. It is framed on lines identical with the one which we had adopted and which worked wonders in decreasing infant mortality.

"If we had the facilities Brooklyn gives her Health Department, why we——" Dr. Wende didn't finish the sentence, but he meant to add, "we wouldn't do a thing."

"The city is only three times as large as Buffalo, yet they have 247 men in the employ of their Health Department, against our 28. They have five bacteriologists, three chemists and three laboratories—a chemical laboratory and two bacteriological laboratories."

SOME BROOKLYN SCHOOL HOUSES.

Here are a few extracts from reports now in the possession of the Bureau of Sanitary Engineering, Department of Health:

"Closets—Good ventilation is impossible. Odor is so strong that some of the windows in the hall and adjoining rooms overlooking the court yard cannot be opened except for necessity.

"Stairway—Narrow and poorly lighted. Strong and constant draught in this part of the building is a cause of much discomfort and possible illness to both teachers and pupils.

"Drinking Facilities—Very insufficient. There are in the basement two drinking places, where there are but five cups for 1,200 children on each side of the play room. The fountains in the new part are supplied from a pipe which passes so near the furnace that the water is warm and disagreeable.

"Ventilation—None whatever, except by windows. No vent in room or closets, except by opening window. No plumbing. Inadequate supply of drinking water. New building badly needed." —MUL, Brooklyn Eagle.

Nevertheless, there is a committee on health; the chairman and several other members of it are physicians. But the rule for the government of the committee is to take cognizance of whatever may be referred to it by the Board of Education!

A SPECIMEN COURT HOUSE.

The March Grand Jury of Brooklyn gave the following summary of the existing conditions of the Butler Street Police Court House:

"The house being occupied by the Police Court, on the corner of Court and Butler streets, is a disgrace to the city and to humanity. It has been more than once termed before the Black Hole of Calcutta. In the historic dungeon in India 146 persons were incarcerated in a chamber twenty feet square, ventilated by two small windows. In the police court in Brooklyn there have been occasions when 178 miserable prisoners were confined in a small space, ventilated also by two small holes. It is, we are informed, no uncommon occurrence to have some wretch hauled out from this pen who has succumbed to combined fetid heat and poisonous air. When inspected by us, some time after the removal of the prisoners, the stench was terrible. The Society for the Prevention of Cruelty to Animals would not knowingly place a dog in the pen used by the city of Brooklyn for human beings. It is necessary to disinfect it twice daily. The place is hot in summer and cold in winter, and it is barbarous to continue it longer. The entire court is dilapidated. What once was carpet has not been removed from the floor or cleaned for eight years, and is now a mass of filth. It should be removed and burned, and an agreement should be made whereby the floors be frequently and regularly cleaned. This building has been condemned by the Board of Health and by the previous Grand Juries, and cannot be longer used without daily violation of the laws of health, decency and humanity. The subject is not new, but for that reason it is time that the nuisance were stopped.

"In this court nearly 47 per cent. of the police business of the city is transacted. The prisoners are loaded and unloaded on the public streets in full sight of curious crowds, the whole arrangement being bad and disgraceful. We urge that the Board of Estimate or their successors provide at their earliest possible time for erect-

ing such buildings as will properly accommodate this court, and possibly with it one of the minor courts. We suggest that immediate steps be taken to secure the basement of the present building, or a portion thereof, for use as a prisoners' pen. This change should be made before summer.

"There are two pens—one for women, the other for men. The stench which comes from them fills the court room every time a door is opened to let a prisoner out. The men's pen is not more than twenty feet long. It is about seven feet wide and only a few inches more than six feet high. Two skylights let in light. They are supposed to ventilate, too, but they don't. The plumbing is so bad that the place is full of a nauseating odor at all times. There are two benches in the pen, but they are only in the way, because on crowded days a man sitting down takes up too much room. Prisoners are sometimes kept confined in the pen for hours, and almost daily men are taken out in an unconscious condition. Sometimes the men cry out until the court officers have to let them out in order to let the court proceed.

"In the women's pen about the same conditions exist. There are fewer women prisoners than men, but their pen is smaller, being about fifteen feet long. There is scarcely any light in the place, and when there are more than fifty prisoners they overflow into the clerk's room. Sometimes it is necessary to empty the women's pen into the clerk's room, in order to keep all the male prisoners in confinement. When that is done the clerk and his assistants have to stop all work until the women are disposed of. Every morning and evening the pens are sprinkled with a liquid disinfectant. This is done by order of the Health Department, but beyond this the Health Department does not appear to have recognized the need of any other action."

MORTALITY AND MORBILITY REPORTS AND REVIEWS.

Correspondents under this head are particularly requested to be as prompt as possible.

ALABAMA.—W. H. Sanders, M. D., State Health Officer, Montgomery.

Mobile, 37,817. J. A. Abrams, M. D., Health Officer, reports for January: Deaths, 98—28 under five years of age. From consumption, 12; annual death rate, 30.12.

CALIFORNIA.—J. H. Davidson, M. D., President, Los Angeles; J. R. Lane, M. D., Secretary, Sacramento. The Secretary reports

for February: Returns from 52 cities, towns, villages and sanitary districts, aggregating a population of 749,530, show a mortality of 989—a death rate of 1.31 per 1,000, or an annual death rate of 15.72. 150 were from consumption, 100 from pneumonia, 30 from bronchitis, 6 from congestion of the lungs, 14 from diphtheria (and croup), 16 from measles, 12 from typhoid fever, 2 from malarial fevers, 8 from cerebro-spinal fevers, 48 from cancer, 2 from erysipelas, 105 from diseases of the heart, 10 from alcoholism, 14 from grippe, 386 from other causes.

Reports of prevailing diseases from 30 localities outside of the larger cities and towns give 33 cases of pneumonia, 96 of bronchitis, 14 of pleurisy, 14 of congestion of the lungs, 26 of diphtheria, 118 of measles, 57 of whooping cough, 218 of grippe, 37 of typhoid fever 47 of malarial fevers, 84 of cerebro-spinal fevers. Measles were reported epidemic at Forest Hill, Folsom, Etna Mills, Watsonville, St. Helena, San Mateo, Fresno, and Pleasanton. Whooping cough was reported epidemic at Fresno. Mumps were reported epidemic at Selma and El Monte township. Twenty-five cases of chicken pox were reported at Folsom.

San Francisco, 360,000. Reports for February: Deaths, 551—122 under five years of age. From consumption, 8; acute pulmonary diseases, 81; from zymotic diseases, 4; diphtheria (and croup), 9; typhoid fever, 2. Annual death rate, 18.36. Contagious diseases reported during the month: Diphtheria, 13; scarlatina, 9.

Los Angeles, 100,000. Reports for February: Deaths, 107. From phthisis, 17; tuberculosis, 8; acute pulmonary diseases, 12. Annual death rate, 12.84.

COLORADO.—Denver, 160,000. William P. Munn, M. D., Health Commissioner, reports for February: Deaths, 152. Of these 31 were caused by consumption, 16 contracted elsewhere; 24 by pneumonia; 6 by bronchitis; 2 by pulmonary congestion; 5 by diphtheria; 11 by measles; 2 by whooping cough; 4 by typhoid fever, and the rest from scattering causes. Annual death rate, 11.40.

Annual report for 1896 opens with an enumeration of "urgent sanitary necessities for Denver in 1897," as follows: "1. A stream disinfecting plant; estmated cost, $5,000. 2. Extension of Steele Memorial Hospital; estimated cost, $2,000. 3. A properly constructed and operated system of sand filters for the domestic water supply of the city; estimated cost, $300,000. 4. More systematic inspection and supervision of dairies; estimated cost, $2,500 per year. 5. Extension of field of work of the bacteriological labora-

tory; estimated cost, $1,500 per year. 6. More rigid inspection of meat, especially of all live stock to be slaughtered in or near this city; estimated cost, $2,000 per year."

These necessities are forcibly shown in the report that follows. Denver being one of the most heathfully situated cities on the continent, yet having a larger ratio of preventative sickness consequent upon the neglect of conditions common to all concentrated communities. The population of the city is estimated at 150,000. Deaths reported for the year, 1,571. From assigned causes: Tuberculosis, 358; diphtheria, 19; scarlatina, 22; measles, 10; typhoid fever, 91; diarrhoeal diseases, 96; 596, or over 36 per cent. of the total mortality from confessedly preventable diseases, besides 117 from pneumonia, at least, partially so. No matter how small the death rate in any community, a ratio of mortality from preventable diseases as large as this is discreditable to it. Moreover, a very small death rate, only 10.48 per 1,000 of population, with a large ratio of mortality from preventable diseases, is always suggestive of an overestimated population, or deficient registration. However this may be with regard to Denver, it is quite safe to estimate that the cost of typhoid fever alone to that city in 1896 was, at least, fully equal to the estimated cost of the sanitary necessities enumerated by the Health Commissioner.

Colorado Springs.—The Health Officer reports (Col. Telegraph, March 24), for 1896: Deaths from consumption, 98, 3 contracted in Colorado; scarlatina, 75 cases; typhoid fever, 403 cases; diphtheria, 33 cases, 13 deaths; measles, 85 cases, 3 deaths. Death rate, 17.75; exclusive of consumption, 12.09. The report is very imperfect, but cleanliness is urged. The "Gazette" of March 5, remarks upon the uncleanly conditions and deficient health regulations, and says: "Some of the cows which furnish milk for Colorado Springs habitually stand in the sewage which is discharged from the pipes of the city, others regularly drink the water which is contaminated by the sewage of Colorado City and Manitou. No attempt is made to regulate, inspect or control the milk business of Colorado Springs, so far as immunity from disease germs is concerned." Under such conditions, Colorado Springs doubtless will, as it certainly ought to, be abandoned as a health resort.

Connecticut.—Professor William H. Brewer, Ph. D., New Haven, President; Professor C. S. Lindsley, M.D., Secretary, New Haven. The Secretary's bulletin for February comprises reports from 166 towns in the State, with an aggregate population of 852,-

210, from which the number of deaths reported for the month was 1,142—257 under five years of age. The death rate for the larger towns is 15.6; for the smaller, 17.1, and for the whole State, 16.1. Deaths from zymotic diseases, 123—10.7 per cent. of the total mortality.

The health of the State during the month is fully up to the average. There is quite an epidemic of diphtheria in Ansonia. Grippe is also prevailing more widely, although not so fatally as in former times. Pneumonia and lung affections are in season. But no severe epidemic anywhere has been reported at this office.

The annual abstracts of the vital statistics of 1896 have all been received. There were 15,096 deaths from all causes in the State which gives an annual death rate of 17.6 per 1,000 of the living population. The death rate of the previous year was 17.8. There were 21,324 births in the State during the year, which was a birth rate of 24.9 per 1,000.

The report of vital statistics of the State for 1895 shows for the ten years ending with and including 1895 a decrease in the annual number of deaths from consumption from 1,364 to 1,358, notwithstanding the increase of about 130,000 in the population of the State during that time. Heart disease during the same time rose from 689 to 1,016 a year; pneumonia, from 827 to 1,289; Bright's disease, from 344 to 605, and bronchitis, from 197 to 539. Deaths from insanity show an increase during that period of about 60 per cent. Typhoid fever shows the slight annual increase during those years from 244 to 259. Thirty years ago the deaths from that disease were 332, and as far back as 1855 they were 273. The decrease, despite defective returns during the earlier period and the large increase of population since, indicates the effectiveness of the measures to check the spread of the disease.

Marriages reported during the year, 6,623—793 more than in the previous year. One marriage to every 123.3 of the population, on a marriage rate of 8.1 per 1,000.

Births, 19,931. 366 were plurality births. 57.2 per cent. were children of foreign parents or with one parent foreign, and in only 41.4 per cent. were the parents both native, a small percentage of cases not being ascertained. The decadence of the farm towns of the State is indicated by the fact that in 50 towns of the 168 in the State, births in 1895 exceeded deaths; of the 50 towns all are country towns but two. The birth rate was 24.4 per 1,000 of population. Divorces granted during the year, 417, and 293 divorced persons married again.

New Haven, 110,000. Health Officer Wright reports for 1896: Deaths, 2,019. Consumption still heads the list as cause of death. there being 194 deaths from this disease, while pneumonia with 181 deaths and diarrhoeal diseases with 164 deaths follow closely. The total number of deaths from zymotic diseases was 438. 411 cases of diphtheria against 108 for 1895. Of these 98 proved fatal, a mortality of nearly 25 per cent.; the mortality for 1895 being just 25 per cent. In the opinion of your health officer this mortality might have been materially reduced had all these cases been properly treated with anti-toxine serum at an early period in the course of the disease. 245 cases of scarlatina, against 149 in 1895, with 12 deaths. No definite estimates of the cases of measles can be made, as the complaint is not reported as accurately as desirable. There were 28 deaths from this malady. 186 cases of typhoid fever, against 102 in 1895. He ascribes the outbreak in August and September to the use of polluted milk. Of 62 cases reported, 52 on investigation used milk purchased from the unsanitary source, a record plainly indicating the need of energetic sanitary work.

DELAWARE.—F. W. Cooper, M. D., President, Camden; E. B. Frazer, Secretary, Wilmington.

Wilmington, 72,500—8,500 colored. Board of Health report for 1896: Deaths, white 988, colored 216; death rate respecively, 15.43. 25.41: 16.62. Prevailing causes: Deaths from consumption, 115; tuberculosis, 17; pneumonia, 97; other lung and bronchial diseases, 45; diarrhoeal diseases, 72; diphtheria (and croup), 42; typhoid fever, 15.

The President of the Board urges the repeal of so much of an existing ordinance as requires physicians to report cases of typhoid fever, contending that the attending physician can give all needful instructions to prevent the spread of that disease without invoking the interference of the health authorities.

FLORIDA.—Hon. W. B. Henderson, President, Tampa; Joseph Y. Porter, M. D., State Officer, Jacksonville.

Pensacola, 15,000. B. R. Pitt, President, reports for March, 20 deaths—2 under 5 years of age. Annual death rate, 16.

ILLINOIS.—William E. Quine, M. D., President, Chicago; J. W. Scott, Secretary, Springfield.

Chicago, 1,619,226. William R. Kerr, Commissioner. Report for February: Deaths, 1,772—695 under five years of age. From diphtheria, 40; typhoid fever, 46; consumption, 180; pneumonia, 295; bronchitis, 138; measles, 33. Annual death rate, 14.04.

IOWA.—E. H. Carter, M. D., President, Des Moines; J. F. Kennedy, M. D., Secretary, Des Moines.

The State Board bulletin for March, reports since preceding: Diphtheria, 13 localities; scarlatina in 8; measles in 7.

Davenport, 35,000. A. W. Cantwell, M. D., Physician, reports for February: Number of deaths, 33—8 under five years of age. Death rate per 1,000, 12.2.

INDIANA.—The new State Board has organized by the election of Dr. Henry Jameson, of Indianapolis, President; Dr. T. N. Hurty, of Indianapolis, continued, Secretary. Dr. T. Henry Davis, of Richmond, was first elected President, but he declined, on the ground that as the board contemplated a good many reforms, it would be better to elect Dr. Jameson, the Indianapolis member of the board, President. After he had insisted that this ought to be done, Dr. Jameson was elected. Dr. E. D. Laughlin, of Orleans, the other new member of the board, qualified and took his seat.

It was decided to enter actively into the work of suppressing typhoid fever and diphtheria.

KANSAS.—Topeka "Journal," March 9: "By unanimous votes the Senate last night passed the bills abolishing the State Board of Health and the State Board of Public Works. The bills repeal the laws under which these boards were created, and if finally passed by the Legislature and signed by the Governor, will save the State in the neighborhood of $12,000 a year." And probably cost more than twelve thousand lives, apparently deemed of no value by the State Senate.

KENTUCKY.—Joseph Matthews, M. D., President, Louisville; John N. McCormick, M. D., Secretary, Bowling Green.

Louisville "Courier-Journal," April 1: "Dr. F. T. Eisenman, Physician to the State Board of Health, and Dr. J. E. Cashin, State Bacteriologist, have been investigating cases of glanders among horses. Fourteen well-defined cases were found. Judge H. C. Howard, of Paris, and others had a conference with Gov. Bradley and pointed out to him that the present appropriation for the State Board of Health, which is only $2,500 per annum, is woefully insufficient. The Governor will recommend to the Legislature, and Representative M. C. Swinford, of Harrison County, who is very much interested in the matter, will introduce bills increasing the appropriation for the Board, and providing for a remuneration to owners of stock which must be killed."—Since the appropriation urged is for the protec-

tion of the health of horses, it will probably be granted. It is to be hoped, however, that some proviso may obtain for the protection of the health of the people by the purification of the water supplies against the prevalence of typhoid fever.

Health Officer W. P. White, of Louisville, promises that "the offal and dirt lying around in the sinks and drains, instead of being carried away by the sewers" of that city, will be remedied this year.

LOUISIANA.—R. S. Oliphant, President, New Orleans; G. F. Patton, M. D., Secretary, New Orleans.

New Orleans, 275,000—80,000 colored. Deaths in February, 563; colored, 219; 65 under five years of age, 35 colored. Deaths from consumption, 76; pneumonia, 66; bronchitis, 20; influenza, 39; diphtheria, 11. Death rates—Whites, 21.17; colored, 32.85: 24.57.

MAINE.—C. D. Smith, M. D., President, Portland; A. G. Young, M. D., Secretary, Augusta.

At the first quarterly meeting, or, annual meeting, as it is called, held March 29, the secretary was instructed to consult a legal authority as to the power and duty of the State Board of Health in prosecuting those secretaries of local boards of health who wilfully fail to make an annual report to the State Board and to report outbreaks of contagious diseases, as the law requires.

Ninth report of the State Board, for the two years ending December 31, 1895, a volume of 272 pages, comprises a painstaking and, apparently, very complete summary of the principal communicable diseases in the State for that period, together with a gratifying degree of successful work in rendering them less prevalent. A large proportion of the reports from local boards state that no cases of diphtheria, of scarlet fever, or of typhoid fever were known to the board. In most of the outbreaks of those diseases they appear to have been confined to the first cases or at most to the first houses.

With regard to tubercular consumption a constant effort has obtained to instruct the people by circulars and other means, in necessary measures for its prevention and spread—notably by circular "On the Prevention of Consumption: Tuberculosis is an infectious disease. The breath of the consumptive patient is not infectious. The sputum is harmless so long as it remains moist. Tuberculous infection is produced, in the great majority of cases, by the inhalation of dried and pulverized tuberculous sputum."

Disinfection has also occupied a prominent place in the work of

the Board, resulting in the invention of an apparatus for the practical use of *formic aldehide*, by Prof. Robinson (member of the Board), described in our December number.

During the early part of the biennial period for which the report is made, smallpox was widely distributed throughout the United States, and the vigilance of State and local boards of health was taxed to prevent the appearance of the disease and to keep outbreaks from extending. Several outbreaks occurred in Maine, but in each case the disease was confined to the primary case or to the first household. Vaccination was urged and very generally practiced.

One hundred and thirty-seven samples of water were analyzed from various parts of the State, from wells, springs, proposed water supplies, existing water supplies, etc., and the sources of supply diligently examined.

"Sand Filtration," by Geo. W. Fuller, Biologist-in-Charge of the Lawrence Experiment Station, Massachusetts, is a paper of great practical utility to all who have need of purifying process of water supplies and would understand this process. "The Present Status of the Antitoxine Treatment of Diphtheria," by Chas. D. Smith, M. D., President of the Board; and "Ventilation of School Buildings," by S. H. Woodbridge, are also instructive and useful contributions.

MARYLAND.—John Morris, M. D., President, Baltimore; John S. Fulton, M. D., Secretary, Baltimore.

Baltimore, 506,398—73,344 colored. James F. McShane, M. D., Health Commissioner, reports for February. The weather: The mean barometric pressure during February was 30.11 inches; mean temperature, 37°; total precipitation 5.13 inches, an excess in precipitation during the month of 1.63 inches; prevailing direction of wind, west.

Deaths, 688, a decrease of 229 compared with the corresponding month of February, 1896. Of these 525 were whites and 163 colored; a death rate of 14.16 per thousand for the former and 26.08 per thousand for the latter. The death rate per thousand for the whole population was 16.31. 34 died from infectious diseases, 105 from consumption, 102 from pneumonia, 34 from influenza, 23 from bronchitis, 16 from Bright's disease, 25 from heart disease, 21 from nephritis, 19 from apoplexy, and 8 from typhoid fever. 234 or 34.01 per cent. of the total deaths were in children under five years of age. Infectious diseases reported, 218 cases, a decrease of

97 compared with the preceding month. 89 of the deaths occurred in public institutions, of which 22 were reported as non-residents.

MASSACHUSETTS.—H. P. Walcott, M. D., Chairman, Cambridge; S. W. Abbott, M. D., Secretary, Boston.

Boston, 501,083.—Samuel H. Durgin, M. D., Chairman of Board of Health. Health reports delayed. "Old Buildings to Stand." The Senate bill to allow the Board of Health of Boston to tear down buildings condemned as nuisances and which cannot be so repaired to be made fit for human habitation, has been defeated.

MICHIGAN.—Hon. Frank Wells, President, Lansing; Henry B. Baker, M. D., Secretary, Lansing.

The Secretary reports for the month of March: The prevailing direction of the wind was northwest, the velocity was .2 of a mile per hour greater, the temperature was 6.67 degrees higher, the rainfall was 2.86 inches more, the absolute humidity was more, the relative humidity and the day ozone were less, the night ozone was more and the depth of water in the observation well was two inches more. Compared with the preceding month, measles, pleuritis, neuralgia and consumption increased in area of prevalence. Compared with the average for March in the eleven years, 1886—1896, measles was more prevalent and consumption and diarrhea were less prevalent. Including reports by regular observers and others, consumption was reported present in Michigan in the month of March, 1897, at 179 places; measles at 148 places; diphtheria at 64 places; scarlet fever at 47 places; typhoid fever at 32 places; whooping cough at 24 places, and smallpox at 1 place. Reports from all sources show consumption reported at 3 places more; measles, at 47 places more; diphtheria, at 10 places less; scarlet fever, at 3 places less; typhoid fever at 2 places less; whooping cough at 2 places less, and smallpox at 1 place more in the month of March, 1897, than in the preceding month.

Detroit, 275,000. S. P. Duffield, M. D., Health Officer, reports for February, 360 deaths—66 under five years of age. Annual death rate per 1,000, 14.07. Deaths from consumption, 16; pneumonia, 39; diphtheria, 24; meningitis, 11. There is a decrease in diphtheria of 53 cases below the record of January, and of scarlet fever a decrease of 25 cases, with but one death.

MINNESOTA.—Franklin Staples, M. D., President, Winona; H. M. Bracken, M. D., Secretary, St. Paul.

Minneapolis, 225,602.—H. N. Avery, M. D., Commissioner, reports for February: Deaths, 53—45 under five years of age. Deaths

from diphtheria, 5; consumption, 23; typhoid fever, 6. Annual death rate, 7.76. Death rate for 1896, 8.81.

Typhoid fever ("Journal,") March 22: "The health department records show that so far this month there have been nearly 300 cases of typhoid fever reported to the department and twenty-four deaths from the disease. There can be very little doubt but that the city is in the midst of an epidemic such as seldom if ever visited it."

St. Paul, 215,582.—A. J. Stone, M. D., Commissioner. Mortality for February, 120—33 under five years of age. Deaths from typhoid fever, 2; diphtheria, 2; consumption, 20; pneumonia, 18. Annual death rate, 6.68.

MISSOURI.—F. J. Lutz, M.D., President, St. Louis; Paul Paguin, M. D., Secretary, St. Louis.

St. Louis, 600,000—35,000 colored. M. C. Starkloff, M. D., Commissioner of Health, reports for February: Deaths, 826—220 under five years of age; from zymotic diseases, 61; diphtheria, 18; whooping cough, 9; typhoid fever, 9; phthisis, 92; pneumonia, 188. Annual death rate, 16.5.

Kansas City, 165,000.—E. Von Quast, M. D., Health Officer, reports for February: Deaths, 172—67 under five years of age. Deaths from diphtheria, 3; typhoid fever, 1; phthisis, 3; tuberculosis, 5; pneumonia, 41. Annual death rate, 12.5.

NEW JERSEY.—C. F. Brackett, M. D., President, Princeton; Henry Mitchell, M. D., Secretary, Asbury Park.

Newark, 230,000.—Health Officer Chandler reports for the five weeks ending April 10: Deaths, 486—145 under five years of age; from diphtheria, 17; consumption, 58; pneumonia, 78; other respiratory diseases, 52. Annual death rate, 21.97.

Hudson County (Jersey City and vicinity), 355,231.—W. W. Varick, M. D., President. No report.

Paterson, 105,844.—J. L. Leal, M. D., Health Officer, reports for February, 172 deaths—76 under five years of age. Annual death rate, 16.25. From consumption, 16; pneumonia, 22; bronchitis, 12; diphtheria, 15; typhoid fever, 3; measles, 16. Cases of contagious diseases reported during the month: Scarlet fever, 19; diphtheria, 68; typhoid fever, 5.

NEW YORK.—Daniel Lewis, M. D., President, New York; B. T. Smelzer, M. D., Secretary, Albany.

The Secretary's bulletin for February reports an increase in the mortality over the preceding month from a daily average of 310 to one of 350, and from a death rate of 17.25 to one of 19, this rep-

resents an increase of 1,000 deaths during the month. Among zymotic diseases a small increase has occurred in the deaths from cerebro-spinal meningitis, scarlet fever, measles, whooping cough, and diarrhoeal diseases; from diphtheria there were 100 fewer deaths. From acute respiratory diseases there were 2,000 deaths (more than 20 per cent. of all deaths), which is relatively an increase of 500 over the preceding month; and an increase of 125 in deaths from consumption. The mortality from local diseases is generally increased. Compared with February, 1896, the zymotic mortality is less, and that from most local diseases somewhat greater, the total reported mortality being the same. Grippe was estimated last month to have caused 300 deaths, and in February, 1896, 500 deaths; it may be estimated this month to have caused about 700 deaths—its continued prevalence during March will probably show a larger increase in mortality. Diphtheria caused 370 deaths, the smallest number for this month in ten years, being 100 less than that reported last month; the decrease is in the urban districts. Scarlet fever is reported to have caused but four deaths outside the Maritime district, although its mild prevalence continues to be reported from numerous localities. Diarrhoeal diseases caused a somewhat unusual mortality, as did also diseases of the digestive and nervous systems. The infant mortality was relatively small (28 per cent.), as is customary during the prevalence of grippe, and with it the zymotic mortality, which was less than 10 per cent. The temperature was below the normal, the precipitation was deficient; there were seven clear days and twelve cloudy, and the wind westerly and northwesterly.

Vital statistics will hereafter be paid for, the Legislature having passed a bill requiring that hereafter every municipality in the State must pay 25 cents on the receipt of marriage, birth and death notices. The certificates of all registration are to be promptly forwarded to the State Bureau of Vital Statistics.

New York City, 1,995,000. Report for February: Deaths, 3,139 —1,127 under five years. Death rate, 20.5. Zymotic diseases, per 1,000 from all causes, 106.5; diphtheria, 33; typhoid fever, 15; cerebro-spinal fever, 21; consumption, 459: acute respiratory diseases, 618; diarrhoeal diseases, 43.—The "Medical Record's" unjust criticism of the effort of the Board of Health to repress tuberculosis has had the effect of creating some opposition to it; and inciting remarkable assumption by a few physicians, who think the health authorities should await and depend upon the suggestions

of those who pretend to voice the medical profession, before attempting to institute new methods for the prevention of disease. The result of the more recent action of the Board to prevent communicable diseases in the schools, ought to be generally accepted as a convincing argument against all such fallacies. The first day's inspection of school children at the time of assembling, March 29, comprehended the examination of 4,255 pupils. Among these 140 were discovered to be affected with contagious diseases. They were sent home with cards from the medical inspectors to their parents, explaining the nature of the disease, and suggesting the needful care. There has been an average of about 100 daily since, and criticism has been disarmed.

March 13-14, two cases of smallpox were discovered in lodging houses. On the night of March 15, after bedtime, a corps of 65 physicians from the Health Department, supported by an efficient police, descended upon the lodging houses, where the cases were discovered and others in the vicinity, and by midnight vaccinated over 5,000 lodgers. The raid was repeated the following night, and again until the whole lodging house fraternity was covered. A few cases have cropped out since, but all have been promptly discovered and isolated. But suppose the Board of Health had awaited the suggestion of some medical society committee how to deal with such an emergency?

Brooklyn, 1,100,000. Report for February: Deaths, 1,609—543 under five years. Death rate, 19. From zymotic diseases, per 1,000, from all causes, 119.35; diphtheria, 91; typhoid fever, 4; consumption, 178; acute respiratory diseases, 305.

A New Bacillus.—Drs. Wilson and Hill, Bacteriologists to the Brooklyn Department of Public Health, have conferred upon Health Commissioner Emery the very dubious compliment of naming one of the new bacilli discovered in the Brooklyn foul water supply, in his honor. They claim that it is unique. In the early stage of existence, it is marked by a vivid spot of red. The name bestowed on it is Bacillus Emeriensis. It has not yet been determined whether it is malignant or not, or whether it had anything to do with the bad odor and taste of the water in the fall. Nor does it appear that this particular bacillus is responsible for the disgraceful neglect to protect the water supply at Springfield, or other places, referred to in more detail at the head of these editorial pages. Considering all the circumstances, it is difficult to decide which is the more honored, the Health Commissioner or the bacillus. In their respective relations to the neglected condition and de-

velopments of the Brooklyn water supply, jointly, they will serve to memorialize conditions and discoveries, which Brooklyn should profit by.

Buffalo, 350,000. Report for February: Deaths, 376—137 under five years. Death rate, 14. From zymotic diseases, per 1,000 deaths, from all causes, 175; diphtheria, 23; acute respiratory diseases, 76; consumption, 36; typhoid fever, 5.

Rochester, 170,000. Report for February: Deaths, 179—32 under five years. Death rate, 13.7. From zymotic diseases, per 1,000 deaths, from all causes, 200; consumption, 25; acute respiratory diseases, 27; diphtheria, 9.

Albany, 100,000. Report for February: Deaths, 252—72 under five years. Death rate, 30. From zymotic diseases, per 1,000 deaths, from all causes, 116; typhoid fever, 9; diphtheria, 7; consumption, 31; acute lung diseases, 62.

Elmira continues to be afflicted with typhoid fever. The operation of the filtration plant was prevented by an injunction imposed by a patentee of some portions of the filter plant. A decision of the courts is awaited, while disease caused by the use of foul water prevails.

Watertown, too, has an increased prevalence of typhoid fever. And the conditions are such that the public authorities deserve the fever, if it could be confined to them. March 23: "From one well twenty to thirty cases of typhoid fever have resulted. Some of the victims are dead, and others are so very sick they may die. The well is situated in a court formed by buildings occupied by the Babcock carriage factory. A portion of the shops of the Babcock company are furnished with city water. The men in some of the departments, however, have used this well for their water supply, little reckoning what it would cost them. Out of the reeking depths came material for a number of cases of typhoid fever, some of which have resulted fatally."

Troy, April 7: Health Officer Archambeault reports that there are 30 cases of typhoid fever in the city, from which there have been several deaths. The Health Officer attributes the disease to the drinking water.

North Carolina.—George G. Thomas, M. D., President, Salem; Richard H. Lewis, M. D., Secretary, Raleigh.

March bulletin summarizes reports from 27 towns, with an aggregate population of 88,172 white and 62,213 colored—33 under five years of age—for the month of February: Deaths, 109 white,

105 colored. Death rates, respectively, 14.8, 20.2, 17.1. The chief causes were: From consumption, 48, 21 colored; pneumonia, 37, 21 colored; heart disease, 13.

Meteorological summary for the month: Mean barometer, 30.09 inches; normal for February, 30.13. Highest barometer, 30.68, on the 18th, at Raleigh. Lowest barometer, 29.41, on the 21st, at Hatteras. Mean temperature 45.1 degrees; normal for February, 43.6. Highest temperature, 80, on the 18th, at Rockingham. Lowest temperature, 9, on the 28th, at Highlands and Linville. Average rainfall, 5.9 inches; normal for February, 4.27 inches. Greatest monthly rainfall, 10.23 inches, at Linville; least monthly rainfall, 3.4 inches, at Spring Hope. Average number of clear days, 10; partly cloudy, 6; cloudy, 12; rainy, 10. Prevailing wind direction, southwest. Average hourly velocity, 8.3 miles per hour. Normal direction for February, southwest; normal velocity, 9.3 miles per hour.

OHIO.—S. P. Wise, M. D., President, Millersburg; C. O. Probst, M. D., Secretary, Columbus.

Causes of and deaths from infectious diseases reported to the State Board of Health during the four weeks ending February 28, 1897: Diphtheria, 158 cases, 43 deaths; scarlatina, 160 cases, 3 deaths; typhoid fever, 72 cases, 15 deaths; whooping cough, 81 cases, 2 deaths; measles, 332 cases. Aggregate population represented, 1,141,114.

Cincinnati, 405,000. J. W. Prendergast, M. D., Health Officer, reports for February: 440 deaths—133 under five years of age. Annual death rate, 13.03. From consumption, 58; pneumonia, 52; bronchitis, 29; zymotic diseases, 53—diphtheria, 13; typhoid fever, 8.

Cleveland, 350,000. J. L. Hess, M. D., Health Officer, reports for February: Deaths, 410—142 under five years. From diphtheria, 15; typhoid fever, 2; consumption, 22; tuberculosis, 12; pneumonia, 55; bronchitis, 9. Death rate 14.06.

Toledo, 137,780. J. T. Woods, M. D., Health Officer, reports for February. Deaths, 118—42 under five years of age. Death rate, 10.20. Deaths from consumption, 10; diphtheria, 9; typhoid fever, 1.

PENNSYLVANIA.—Pemberton Dudley, M. D., President, Philadelphia; Benjamin Lee, M. D., Secretary, Philadelphia.

Philadelphia, 1,188,793. Theodore B. Stulb, Health Officer, reports for four weeks ending March 27: Deaths, 2,070—632 under

five years of age. From diphtheria, 112; typhoid fever, 22; consumption, 230; pneumonia, 392.

Pittsburg, 280,000. Report for the four weeks ending March 27: Deaths, 341—142 under five years of age; typhoid fever, 9; consumption, 19; diphtheria, 7. Death rate, 15.47.

Typhoid fever is reported prevalent in Lancaster, and diphtheria in Stroudsburg.

RHODE ISLAND.—A. G. Sprague, M. D., President, River Point; Gardner T. Swarts, M. D., Secretary, Providence. January bulletin reports contagious diseases for December, 1896: Diphtheria, 129; scarlatina, 93; typhoid fever, 27.

SOUTH CAROLINA.—Charleston, 65,165—white, 28,870; colored, 36,295. H. B. Horlbeck, M. D., Health Officer, reports for five weeks ending March 27: Deaths, 116—26 colored. Under five years of age, 36. Annual death rate—white, 14.4; colored, 25.6: 20.

Consumption Among the Negroes.—The State Board of Health held a meeting ("Columbia Register"), March 12, with the purpose of trying to enlist the co-operation of medical associations and other State boards in urging upon the National Government the necessity of properly draining the swamps and rivers, and thus removing one of the most fearful causes of death—malarial fever. Another matter discussed by the board was as to the best means of checking the ravages of consumption among the negroes. It was decided to issue a circular to all colored school teachers, explaining this fact, and showing that the most fruitful cause of the spread of this disease was the habit of expectoration by consumptives on the floors of school buildings and elsewhere.

TENNESSEE.—J. D. Plunket, M. D., President, Nashville; J. Berrien Lindsley, M. D., Secretary, Nashville.

The Secretary's bulletin of March 20 reports: The principal diseases—named in the order of their greater prevalence—in the State for the month of February, were: Lung disease, acute, measles, consumption whooping cough, typhoid fever, diphtheria, malarial fever, rheumatism, mumps, scarlet fever, and chicken pox.

From another source, under date of April 2, we learn with much regret, that a bill has passed the Legislature to "reorganize," but in effect, to wipe out, the present State Board of Health, and to constitute one exclusively of new men—presumably, of men inexperienced in practical knowledge of sanitary methods. It is greatly to be hoped, however, that when the Governor comes to reflect on the choice of men for the new board with reference to the whole ob-

ject of a State Board of Health—the protection of the health of the people—he will consider services rendered, particularly upon the services rendered by those active members, Drs. Plunket and Lindsley, in preventing the spread of yellow fever in 1878-'79, and their scarcely less effective service on several occasions since in preventing the spread of small pox and other epidemic diseases in the State. To be purblind to such service and the practical knowledge gained by it with a view to future usefulness, is scarcely conceivable of any one whose first care should be the public health—the essential element of public wealth.

Memphis, 56,134—27,561 colored. Board of Health reports for March: Deaths, 92—37 white and 55 colored. Of these 29 died of general diseases, 6 of nervous diseases, 4 of circulatory diseases, 18 of respiratory diseases, 9 of digestive diseases. Annual death rate, per 1,000, including non-residents, white, 15.53; colored, 23.95; total, 19.67. Of residents only, white, 10.08; colored, 18.28; total, 14.11.

The Health of Nashville ("Memphis Com. Appeal,") March 26: "A correspondent in the "Nashville Banner" gives some startling figures on the question of Nashville's death rate, as compared with other cities, which will be read with interest by those who contemplate visiting the capital city this Centennial year. It seems the death rate on the Cumberland far exceeds that of any other city in the State. Every citizen of Middle Tennessee knows, says this correspondent, that there isn't a healthier section or belt of land on the civilized earth than that circumscribed within the lines of its territory. Isn't it an absurdity, therefore, that the death rate in Nashville for 1896 should have been 20.61, and in Chattanooga 11.97, or that the white rate in Nashville should have been 16.35 and in Knoxville 7.81? Isn't there something wrong in Nashville when we lose in one month 28 children under five years of age, and Memphis loses only three; when we have 25 deaths in one month from consumption and Memphis has only eight? These figures are startling, truly. Memphis is undoubtedly the healthiest city in the State. In the school of bitter experience she learned her lessons on the necessity of sanitation. From the fiery furnace of pestilence she did not escape unscathed, and her people knew that security was to be found in perfect sanitation and intelligent attento the laws of health. Hence, her sewerage system, still up to date and being constantly extended, was far in advance of any Southern city at the time of its construction, and is far in advance of most

Southern cities to-day. Her Board of Health attracted the attention of leading citizens, and the system of sanitation in vogue prevents all causes of sickness. As much as any other cause, or, perhaps, more than any other cause of the decreased death rate in Memphis is the water supply of the city. Adult Nashvillians do not drink water to excess, and therefore, escape, but the alarming infant mortality of the city clearly demonstrates that children who have not been weaned away from aqueous beverages are the sufferers. Memphis is blessed in having pure water since the introduction of which to common use her death rate has been reduced to a minimum. Nashville might profit by her example."

VIRGINIA.—The term of service of the members of the Virginia State Board of Health having expired March 16, 1897, Gov. Charles T. O'Ferrall commissioned the following to serve the four years' term, beginning that date: Drs. Rawley, W. Martin, Lynchburg; Paulus A. Irving, Hugh M. Taylor, and Landon B. Edwards, Richmond; Vernon G. Culpeper, Portsmouth; John H. Neff, Harrisonburg, and Lewis E. Harvie, Danville. Dr. Martin has been elected President and Dr. Irving re-elected Secretary and Treasurer.

WISCONSIN.—Solon Marks, M. D., President, Milwaukee; U. O. B. Wingate, M. D., Secretary, Milwaukee.

Milwaukee, 275,000. Walter Kempster, M. D., Commissioner of Health, reports for February: Deaths, 339—140 under five years of age. From diphtheria, 10; measles, 10; consumption 29. Annual death rate, 14.79 per 1,000.

THE PLAGUE.

According to latest announcement, at the time of this writing:

BOMBAY April 8.—There has been a marked decrease in plague cases. Last week's total was 360 deaths from the plague and 323 cases of that disease, against 538 deaths and 501 cases during the previous week.

The grand totals of the plague in this city are 10,943 deaths and 9,299 cases, and throughout Bombay Presidency, up to April 2, there have been 22,668 deaths from the plague, and 18,361 cases of that disease which were not fatal.

The international sanitary conference at Venice concluded its sittings March 19th. The two great objects of the conference were to organize sanitary precautions to prevent the spread of the bubonic plague and to prevent its introduction into Europe. The first of these problems was solved by deciding to establish quaran-

tine measure on the shores of the Persian Gulf, the Red Sea, the Suez Canal and the ports along the track of pilgrim and passenger vessels coming from and returning to Egypt, Persia and Indo-China. Quarantine stations (internatonal) will accordingly be established or increased at the Island of Camaran (off the Arabian coast), the Springs of Moses and other points along the route which the plague will have to follow if it makes any progress to the westward. On the island of Ormus, at the entrance of the Persian Gulf, an international quarantine will be maintained. But the intra-European precautions are to be carried out in accordance with the sanitary policy of each nation.

The conference decided that the incubation period of the bubonic plague is ten days; hence, every suspected vessel arriving from an infected port will have to be subjected to a quarantine of ten days, counting from the day of departure. Those ill with the pest will be immediately disembarked and isolated, and the others put under surveillance of ten days' duration from the appearance of the last case. Ample precautions are also prescribed for inspection and disinfection of railways and postal lines of traffic, and for precluding all conveyance of the infection in both intra and extra-European commerce.

Nevertheless (London mail, March 19) the fanatical Mohammedans display the bitterest opposition to the measures taken by the Government for suppressing the bubonic plague. For instance, on Saturday a Mohammedan while leaving the city with his wife, refused to allow her to submit herself to the prescribed inspection. The officials insisted, whereupon the Mohammedan suddenly drew his dagger and stabbed her to the heart. Then he stabbed the official physician and attempted to kill himself.

CUBA.

Small pox and yellow fever continue prevalent. During the week ending April 1, there were in Havana 150 new cases of small pox, and 521 deaths from yellow fever. Fifty new cases and thirteen deaths. Santiago, during the week ending March 27, small pox, 120 cases, with 34 deaths, and in Sagua la Grande, 17 cases, with 6 deaths, of yellow fever.

VITAL STATISTICS OF THE INSURED.

Dr. Clara Bliss Finley, of Washington, D. C., before a convention of insurance underwriters, recently maintained that women are at least equally as safe risks as men. More male than female

children are born, she said, and more men than women die between th ages of fifteen and forty-five. One physician's fifty years' experience showed a total of 3,290 boys and 3,168 girls born. In England and Wales women live about one year longer than men. In London two or three years are in the women's favor. In the census of 1870 the percentage of deaths per thousand was: Male 23.92; female, 20.72. Our own census in 1870 shows deaths between the ages of fifteen and forty-five, men, 72,575; women, 63,100. Of our immigrants between these ages, men, 1,210,583; women, 674,100. More men than women die of nervous diseases. Dr. Finley admits that the books of insurance companies show that more insured women than men die. She reported interviews with twelve managers of large insurance companies, who, when asked if they regarded women as safe risks as men, replied: "Yes, if women had as rigid medical examinations."

BOOK REVIEWS.

VITA-MEDICA: CHAPTERS ON MEDICAL LIFE AND WORK. By SIR BENJAMIN WARD RICHARDSON, M. D., LL. D., F. R. S. 8vo., pp. 500. Price, $4.00. Longmans, Green & Co., 39 Paternoster Row, London, New York and Bombay.

The title of this work is well sustained, yet it conveys a good knowledge of the life of the author by an autodescription of his work, after he had taken time to reflect upon it. The twenty-eight chapters into which it is divided are for the most part distinct essays on the subjects of his investigation. He seems to have begun his life work at a very early age, for his mother, who died when he was but ten years old, in 1838, shortly before her death, urged him to follow her lessons, "and, above all things, must learn to be a good doctor, the profession of medicine being, in her opinion, the noblest in the world."

It was at the time when the great sanitary movement in England began, and he appears to have been interested in it from the outset, but not to such a degree as to divert his attention from curative medicine, of which he became a distinguished teacher and successful practitioner, though he found time and availed himself of the opportunity to do much in the field of preventive medicine.

In 1855 he established and edited for several years "Public Health," which afterward he called the "Sanitary Review and Jour-

nal of Public Health," and a few years later the "Social Science Review."

When the Social Science Association met at Brighton, in 1875, he was president of it. The subject of his presidential address on that occasion was a fancied one: "Hygeia: A Model City of Health," but was so admirably conceived that his audience was completely carried away with it. The London "Times" made a leader of it. It was, of course, published in full in the "Social Science Review." The "Belgian Moniteur," republished it entire, as also did THE SANITARIAN (Vol. IV.) and several other periodicals. It established the author's reputation as a sanitarian. And from that day to the time of his death, in November last, his words and his works always gained the attention of sanitarians.

Not long thereafter he began the publication of the "Asclepiad," a journal of his own observations and experimental knowledge, but chiefly pertaining to subjects more or less related to preventive medicine. Meanwhile, as before, he was a frequent contributor to periodical medical literature, and the author of several books.

The most important of his published works are "Preventive Medicine," "Diseases of Modern Life" and "The Health of Nations: Review of the Works of Sir Edwin Chadwick."

The chapters of "Vita Medica" are a virtual introduction to, and to some extent, abstract of, those works, besides many essays on practical subjects, together with the detail of many lucid experiments, of practical utility to students of every cult, but above all, to medical students, who would profit by the example of one who was ever keenly alive to the importance of experimental knowledge, either along, or independent of, beaten paths.

THE INTERNATIONAL MEDICAL ANNUAL AND PRACTITIONERS INDEX. Fifteenth year—1877. Price, $2.75. E. B. Treat, 5 Cooper Union, New York.

Year by year this manual has more and more increased in excellence *pari passu*, with the progress of the medical sciences during the period since it first appeared, insomuch that it has earned a place on the table of every progressive medical practitioner. The general arrangement of the book is comprehensive in the highest degree, while the classification and detail is such as to render reference to any and every subject available with the utmost facility.

THE MYSTERY OF SLEEP. By JOHN BIGELOW. New York. Harper & Bros.

A very readable little book, because it is an entirely new view

of an old and exceptionally familiar subject. Our wont has been hitherto to regard sleep as an essentially restful and recuperative function to both body and mind. But not so, this author would have us believe. Rest, of course, our body does while asleep, even under this new view, because it is for the time divested of the mind and unencumbered. But "the mind, or the soul, the *animus* or the *anima*, the intellectual or spiritual functions of our being, can never be fatigued." Needing no rest, it departs while the body sleeps and holds communion with the spirit world. This, though not said in so many words, is the basis of his contention, and on it he advances some arguments scarcely less extraordinary than the strange dreams recorded of ancient dreamers, and their interpretations. And it is for this chiefly that the book is entertaining and commendable to all who would cultivate a fancy for imaginary potentialities.

THE LIQUOR PROBLEM IN ITS LEGISLATIVE ASPECTS. By FREDRICK H. WINES AND JOHN KOVEN. An Investigation Made Under the Direction of Charles W. Eliot, Seth Low and James C. Carter, Sub-committee of the Committee of Fifty to Investigate the Liquor Problem. Boston and New York: Houghton, Mifflin & Co.

The gist of this book is contained in the introduction, which comprehends concise conclusions deduced from a careful and critical examination of the State laws of Maine, Iowa, South Carolina, Massachusetts, Pennsylvania, Ohio, Indiana and Missouri, severally, which make up the body of the work. It might have gone without saying that: "It is evident that methods that succeed in one place do not necessarily succeed in another."

The results of the investigation and the inferences from it which the sub-committee laid before the Committee of Fifty included consideration of prohibition, its successes, its failures, its concomitant evils, and its disputed effects; local option, its systems of licenses; licensing authorities; restrictions on the sale of liquors; druggists' licenses; and the effort of liquor legislation on politics. These subjects are dealt with succinctly. The prevailing difficulty throughout has been that local police will not—it may be said, cannot—enforce a prohibitory law in places where public sentiment is opposed to the law. Therefore, the demand is, under such laws, that a State constabulary has to be charged with their execution.

In so far as a thorough exposure of any evil is the first and most important step towards overcoming it, this investigation of State

laws for the restriction, prohibition, or regulation of the use or sale of alcoholic liquors, pointing out their commendable features and emphasizing their obstacles and objectionable features, is a work of much practical utility, alike commendable to students of the sociological bearings of the question and to all legislative bodies.

CONTEMPORARY LITERATURE.

STREET CLEANING BY DIRECT LABOR.—The two cleanest cities on the Continent to-day are Toronto and New York, and they are both cleaned by direct labor.

New York not only employs and thus directs all its street cleaning and garbage dispatch forces, but it has an organized department, with an adequate and properly adjusted equipment of horses, carts, brooms, stables and stations, and it pays its men $2 a day and upward for eight hours' work. It is by the method of direct labor, under model conditions of employment, that this first worthy result of the kind in a large American city has been achieved.

Toronto, the other of these two exemplary cities, has gone even further than New York in eliminating the contractor. In this enterprising Canadian town, with its 190,000 people, Street Commissioner Jones has, during the last seven years, entirely revolutionized the care of the streets of the city. He has not only organized the execution of this work under a distinct department, but out of the margin thus saved from the annual appropriations for caring for the streets he has actually built and equipped a modest but complete set of workshops, where the entire construction and repair work of the department is executed. A considerable element of this saving of labor has been due to the automatic loading machines, invented in these shops, which elevate the winrows of litter directly from the street into a dump cart as rapidly as horses can walk.—From "Cleaning Streets by Contract," by George E. Hooker, in April "Review of Reviews."

In the "Progress of the World" department of the April "Review of Reviews," the editor comments on the change of administration at Washington, on the tariff bill, and other measures before the extra session of Congress, and on President McKinley's diplomatic appointments; the Graeco-Cretan situation is carefully reviewed, and other recent developments in foreign politics are treated with the thoroughness and impartiality to which the "Review's" readers have grown accustomed.

GRANT TO BUCKNER.—The April "Century," in view of the dedication of the Grant tomb, has been made a "Grant Memorial Number," and contains a number of articles relating to the career of the great commander. Mr. John R. Proctor contributes "A Blue and Gray Friendship," describing the relations between Grant and Buckner. The latter visited Grant at Mount McGregor, and as General Grant could not then speak, he wrote a message to his friend and former adversary. This is reproduced in fac-simile for the first time. The message was as follows:

"I have witnessed since my sickness just what I have wished to see ever since the war; harmony and good feeling between the sections. I have always contended that if there had been nobody left but the soldiers we would have had peace in a year. Jubal Early and Hill are the only two that I know of who do not seem to be satisfied on the Southern side. We have some on ours who failed to accomplish as much as they wished, or who did not get warmed up to the fight until it was all over, who have not had quite full satisfaction. The great majority, too, of those who did not go into the war have long since grown tired of the long controversy. We may now well look forward to a perpetual peace at home, and a national strength that will secure us against any foreign complication. I believe myself that the war was worth all it cost us, fearful as that was. Since it was over, I have visited every State in Europe and a number in the East. I know, as I did not before, the value of our inheritance."

A QUEER FACT ABOUT VISION.—In the eye itself certain things may go on which give us wrong sensations, which, although not truly illusions, are very much like them. Thus, when we suddenly strike our heads or faces against something in the dark, we see "stars," or bright sparks, which we know are not real lights, though they are quite as bright and sparkling as if they were. When we close one eye and look straight ahead at some word or letter in the middle of this page, for example, we seem to see not only the thing we are looking at, but everything else immediately about it and for a long way on each side. But the truth is, there is a large round spot, somewhere near the point at which we are looking, in which we see nothing. Curiously enough, the existence of this blind spot was not discovered by accident, and nobody ever suspected it until Mariotte reasoned from the construction of the eyeball that it must exist, and proceeded to find it.—"Seeing and Believing," by Harold Wilson, M. D., in April St. Nicholas.

MEDIAEVAL METHODS OF THE MASTER PLUMBERS.—Like the old feudal corporations, it would make membership of its benevolent organizations as difficult as possible. "The St. Louis association," said the president of the Milwaukee convention, "has adopted a new constitution, making it a necessary requisite for membership that a candidate must have served five years' apprenticeship and three years a journeyman plumber. This qualification for membership," he added, apologetically, "may be a little advanced for some localities, but I believe that the line ought to be drawn between practical and impractical men." Indeed, it ought; but that is not the object of this restriction; otherwise the work of drawing lines between practical and impractical men would be left entirely to the person that employs them. The object is to make the plumber's business as exclusive as possible, and thus to restrict competition. Never were the feudal corporations guilty of anything more retrogressive or more subversive of their own interests or the interests of the public.—From Reversions in Modern Industrial Life, by Franklin Smith, in Appleton's Popular Science Monthly for April.

PROGRESS OF CIVIL SERVICE REFORM.—When Mr. Carl Schurz, in speaking of the progress of civil service reform, declared that the cause won its Gettysburg under President Cleveland, and would win its Appomattox under President McKinley, he not only expressed opinions and hopes in which most good citizens concur, but he set an excellent example in the use of metaphorical language. The popular synonym for defeat is Waterloo. Mr. Schurz might have said that the enemies of civil service reform would meet their Waterloo under McKinley, instead of which he rung in a contemporaneous, homemade American word (two of them, indeed), which is even more conclusive in sound and suggestion than its Belgian rival, and carries its idea vividly into every American ear. We have excellent battles in our history, with resounding names. It is well that we should be taught to use them more freely in our daily business of conveying our ideas.—*Harper's Weekly.*

THE CONFLICT OF RACES, CLASSES AND SOCIETIES, by the eminent Italian sociologist, Professor G. Fiamingo, of Rome, in the April "Monist," will be found to be of the utmost interest to all classes of readers. Professor Fiamingo goes to the bottom of many grave social questions which are now crying for solution, and he handles his subject in a masterly, yet popular, manner.

To AMERICAN readers who have not ready access to the great bulk of the European periodical press, Continental as well at British (and who has?), there is no magazine that can take the place of "The Living Age." The whole world of iterature is its field, and its readers get the best that the world offers. For the busy man and woman of this living age it is invaluable. The subscription has recently been reduced to $6.00 a year, and is published by The Living Age Co., Boston.

THE TEXAS MEDICAL PRACTITIONER is a new name for an old favorite—"The Texas Health Journal"—a monthly magazine devoted to preventive and State medicine. But it contains, besides, sundry articles on curative medicine well calculated to commend it to the medical practitioner, as well as sanitarian. It continues at the popular price, one dollar a year, and if it continues to maintain the excellence with which it has begun, it will doubtless speedily attain the rank which it deserves among the best at the price. A. M. Elmore, M. D., editor and manager, Dallas, Texas.

ANNOUNCEMENTS.

THE FIFTIETH ANNIVERSARY, AMERICAN MEDICAL ASSOCIATION.

The forty-eighth annual session (there were no meetings held by the Association during the years 1861 and 1862) will be held in Philadelphia, Pa., on Tuesday, Wednesday, Thursday and Friday, June 1, 2, 3 and 4, commencing on Tuesday, at 10 A. M.

"The delegates shall receive their appointment from permanently organized State medical societies, and such county and district medical societies *as are recognized by representation in their respective State societies*, and from the medical departments of the Army and Navy and the Marine Hospital Service of the United States."

WM. B. ATKINSON, *Permanent Secretary*,
1400 Pine Street, Philadelphia.

THE AMERICAN MEDICAL EDITORS' ASSOCIATION will meet in Philadelphia, under the presidency of Dr. H. A. Hare, June 1-4, 1897.

FASSETT'S BUREAU OF THE MEDICAL PRESS, representing magazines of established value, will be represented at the meeting of the American Medical Association, in Philadelphia, June 1-4, 1897.

THE SANITARIAN.

JUNE, 1897.

NUMBER 331.

QUARANTINE AND PORT SANITATION.

A FORTY YEARS' REVIEW.

BY A. N. BELL.

A little less than forty-one years ago, while contending with the last epidemic of yellow fever in this vicinity, I had occasion to characterize port quarantines generally, and the New York quarantine in particular, as at that time conducted, in part as follows:

"Everywhere dense population, misery, want and filth constitute the source of epidemic diseases; yet on this very day, the first day of September, 1856, is gathered the detritus of every sickly clime into the New York quarantine! Do the rags of Alexandria—for there has been an infected ship and cargo of them here since June last—grow less infectious from the heat, moisture and confinement of the hold of a ship? Or the putrid hides of South America and the goat-skins of the Cape de Verde become tanned of their poison by wreaking it on the inhabitants of a populous city? *One hundred and fifty* of such ships and cargoes are now encompassed by quarantine in close proximity to the populous shores of the bay of New York! Alas, for the crews and passengers; they are quarantined too—many of them quarantined, as are the victims of this relic of barbarism, on the Bay Ridge from Fort Hamilton to Brooklyn.

"These ships and these cargoes are now as they would have been centuries ago; they are as the thirty-feet depth of slime from the tablelands of Abyssinia deposited in the lap of Egypt; as the Hoogly's putrid emanations, or as the gleanings of the Father of Waters, in which crocodiles only can revel; all of these things lost sight of in the heartless selfishness which dictates a quarantine of persons amidst such foulness. Such quarantines are adverse to

every impulse of sympathy and antagonistic to all the kindly emotions of the heart. They inculcate a beastly selfishness and fratricidal barbarism which has, in the nature of causes, always brought upon the enforcers of it, retributary infliction commensurate with that which they impose upon others. The would-be barricaders of black death, who were infatuated by the hideous terror of judgements inflicted for secret sins, were in some degree excusable for acts measured by the light of science, but that such inhumanity, such remorseless heartlessness and cowardly selfishness should exist and be tolerated now, is the most inconceivable incident of barbarism connected with the present age."*

About the same time when the article was written from which the above extract is taken, and during the two years next following, I made frequent communications of the same tenor to the newspapers, encouraging the animosity awakened against the New York quarantine as it was at that time. The structures—hospital, warehouse and several shanties—in the growing village of Tompkinsville, on the Staten Island shore, a little north of opposite to and about one mile distant from Fort Hamilton, fenced in. The anchorage ground for infected vessels was in the Narrows, extending from Graves End bay (between Fort Hamilton and Coney Island), to about three miles northward, between the Long Island and Staten Island shores. It was through this squadron of infected shipping that all other vessels had to pass on their way up to the city wharves, and to facilitate the passage, the infected vessels were usually anchored as close to the Long Island shore as practicable. Such was particularly the case in the summer of 1856, when Bay Ridge became infected with yellow fever, under favorable conditions, as follows:

"On the 9th day of July, 1856, the alluvial plain of sand at Fort Hamilton and Bay Ridge was subjected to an unusually heavy rain (1.80 in.), which, from the conformation of the surface, could not run off. Succeeding this followed a drought and a high temperature—the mean of which, recorded at 7, 2 and 9 (P. M) o'clock daily, was 82°58. On the 27th, the thermometer at 2 o'clock, 95°; 28th, 97°; 29th, 80°. On this day the first case of yellow fever on shore occurred. The mean of the hydrometer for the same period was 75°80, and for the twenty days inclusive, 9th to 20th, there was but .01 rainfall—on the 15th. On the 29th, rainfall .30 in. During this period the wind ranged from S. W. to N. W.;

*Quarantine. Hunt's Merchants' Magazine, October, 1856.

from 21st to 29th, from S. W. only." (Abstract from Meterological Registry, Fort Hamilton). This fleet of yellow-fever infected ships was anchored within a few hundred yards of the shore, directly to the windward.

The local and climatic conditions being alike favorable, infection was close at hand and had a fair wind. It was sown in fruitful soil and soon became epidemic, *to the extent of the favorable local conditions.* It was limited to the unpaved, heated and waterlogged sandy soil. It did not extend to the paved streets, because the rainfall ran off.

The relation of the quarantine to this epidemic gained wide publicity. On the eve of it, October 29th, 1856, at a meeting of the Board of Health of Philadelphia, the late Dr. Wilson Jewell, President of the Board, introduced the following resolution, which was adopted:

"*Resolved,* That a committee of three, with the president, be appointed to correspond with the boards of health of New York, Boston, Baltimore, and New Orleans, on the propriety of calling a convention of delegates from the various boards of health in the maritime cities of the United States, for the purpose of conference in relation to the establishment of a uniform system of revised quarantine laws.

This was the first action taken by any official organization in this country with a view to practical sanitation on a scientific basis. The convention was called, and was held in Philadelphia. May 13-15, 1857. It was attended by about one hundred delegates, representing twenty-five boards of health and other organizations. A letter was read at the convention by this writer, of which the following is an abstract:

"Having, by previous occupation and opportunity, as a medical officer in the Navy, become much interested in quarantine, I have concluded that the proper object of quarantine can be accomplished only by such modification of the regulations as will harmonize them with the enlightenment of the age and the spirit of humanity:

1. Immediate freedom to all well persons.

2. Warehouses for infected goods, with provision for unloading and ventilating such as are found to be so, *immediately* on arrival.

3. Anchorage ground at such distance and direction from the warehouses, and all populous neighborhoods, as to endanger no one.

4. A hospital, also at such a distance from the warehouses and anchorage ground, as to be in no danger from them.

"Quarantine on such a basis presents the greatest advantages for health, and the least obstacle to commerce. Well people have their freedom without being kept subject to the causes of disease; sick persons a chance of recovery; merchants their ships in the shortest possible time, and goods their safety." * * * * *

Three other conventions were held consecutively, in Baltimore, New York and Boston, 1858, '59 and '60. At the one held in New York, I was made chairman of the Committee on Quarantine Regulations. Drs. Elisha Harris, Wilson Jewell, Isaac A. Nichols, and D. B. Reid, associates.

In 1857 the number of vessels in the New York quarantine was less than in the preceding summer, and there were no cases of yellow fever on shore, but in the summer of 1858, there was again a large fleet. The quarantine hospital was crowded with cases of yellow fever, and there were reports of cases in the vicinity outside, but they were not verified. Nevertheless, antipathy to the institution became so strong that on the night of September 1st, 1858, an incensed multitude, estimated at a thousand strong, with leaders, who entered the hospital and removed the sick from their beds to the lawn at a safe distance, while some carried crowbars and pick-axes, and others torches, and a few accumulated combustible material, which they piled up in and round about the hospital and the other buildings and set it on fire. Within a few hours the structures were naught but a mass of ruins.

The proceeding was declared a riot by the officials of the time, but the effort to bring the "rioters" to trial wholly failed, partly because they were so numerous, but chiefly because the community roundabout was in sympathy with them, and no identification could be established. A floating hospital was extemporized, of which the late Dr. Elisha Harris was appointed Superintendent. I had become acquainted with Dr. Harris and had his co-operation when contending with the yellow fever on Bay Ridge, two years before, while he was Physician-in-Chief of the Quarantine Hospital. (The physician of the hospital had nothing to do with the manner of conducting the quarantine—that was the sphere of the Health Officer). I was consulted by Dr. Harris in fitting up the floating hospital—effecting the needful changes in an old side-wheel steamship. The only portion of the fitting-up specially worthy of mention, in this connection, was a large kettle on one of

the side wheel-guards with a heater for boiling water, as a receptacle for the disinfection of all washable material. Other infected material was to be burned or cast overboard. The floating hospital was appropriated to the care of yellow-fever patients exclusively; provision was made for the care of smallpox patients by the Commissioners of Emigration, at Ward's Island.

Measures were soon after undertaken by the quarantine officials for the re-establishment of the hospital and other structures on Staten Island—further down the harbor—beginning with the reconstruction of an old factory building. But ere the reconstruction was half finished, some good citizen set it on fire. A second effort was made, but this too was frustrated. Strenuous efforts were next made to occupy a portion of Sandy Hook, but prohibited by the Government authority. Meanwhile the anchorage ground was changed to the Lower Bay, and the floating hospital was adequate to the needs.

At the Quarantine and Sanitary Convention, in Boston, June 14, 1860, the committee, of which I was made chairman the year before, reported a "code" in detail. It was in part derived from the Imperial decree of France in 1853, comprehending the conclusions of the first International Sanitary Congress, held in Paris, in 1851.

The only citations from our report specially pertinent to this review are that: "All quarantine regulations of any place whatever, should bear with equal force against the toleration or propagation of disease as against its introduction; and authority to prevent the introduction of disease in any place should be equally applicable against its exportation. * * * All vessels before landing must be visited by a doctor of medicine, and submit to hygienic measures if deemed necessary. The vessel shall be visited in all her parts, and her hygienic state ascertained. The authority shall inquire into the state of the provisions and beverages —in particular into the potable water and the means of preserving it; he shall also inquire into the state of the crew, and in general into everything relating to the maintenance of health on board." And—

"That in connection with every quarantine establishment, at the warehouses as well as at the hospitals, properly constructed *steam generators* and steam chambers or vats be provided for the disinfection of all personal, hospital and ship's clothing and bedding, together with such other infected goods or things as may properly

be subjected to high steam heat."* This regulation was formulated on my first use and observed results of steam applied to vessels infected with yellow fever—the steamer Vixen and the schooner Mahones, while on service in the Mexican war, 1848.

In the first year of the civil war, in anticipation of much yellow fever in the port of New York, I was appointed Superintendent of the floating hospital. It was during the time of my service in this capacity that the first disinfection of a vessel in the New York quarantine, or indeed, in default of evidence to the contrary, in any of the port quarantines, was ever effected, as follows:

"U. S. Transport Delaware,
"New York, November 30, 1862.

"DR. A. N. BELL.

"Dear Sir: During my confinement in quarantine hospital with yellow fever last summer, you suggested disinfecting my vessel with steam. In accordance with the suggestion, before my recovery, the engineer steamed the lower cabin where nearly all the sick had been confined. After my recovery I more effectually steamed the vessel by closing her up below and driving the steam through the lower hold and bilges. This I did by attaching a hose to the boiler and leading it below and through an aperture left for that purpose. Although we remained in quarantine three weeks after the first steaming, we had no sickness among a crew of twenty persons, and since that time the Delaware has been in a perfectly healthful state. After refitting" (for which she was permitted to go up to the city, on my judgment), "the Delaware was sent to Port Royal with soldiers, and encountered a heavy gale; of course everything was damp, but no sickness occurred on board, and the troops remained perfectly healthy after landing. On my return over 100 invalid soldiers came North with me, but there was no sickness among them, except that which they brought from the hospitals. The only injury resulting from the use of the steam was to the paint, which it stained; and the first time charring the leather, and the second time melting the rubber hose. In using steam, hose which cannot be affected by heat easily ought to be provided especially for the purpose, by a copper coupling about ten feet long, attached to the cock where steam comes directly from the boiler and the heat is most intense. I am so well satisfied of the beneficial effects of steam on shipboard that I would be sure

*Revised Report in full Public Health Papers and Reports, American Health Association, vol. xviii. (1892); also Sanitarian, vol. : 9.

of cleaning my vessel of that dread disease, the yellow fever, by its use in a very short time.

"JAMES S. CANNON,
"Master U. S. Transport Delaware."

For averment of this being the first disinfection of a vessel ever effected in the New York Quarantine, or any other, it seems unnecessary to do more than to call attention to the practice hitherto and indeed, until very recent years, of placing a few plates of chloride of lime with a little sulphuric acid poured on, or by burning a few pounds of sulphur in the hold of the ship, with never an attempt to expose the bilge; or still more absurdly, by putting a few tons of ice in the hold of a wooden ship—lying in water of 70° temperature to freeze out the infection! Nobody now believes that disinfection was ever effected by such means. Notoriously, infected vessels thus treated were *rounders*—they remained disinfected, and the outbreak of infectious disease aboard them, was common whenever and wherever they encountered favorable climatic conditions.

On the conclusion of my service as superintendent of the floating hospital in November, 1862, I reported to the Commissioners of Quarantine:

"My past summer's services confirm my previously expressed judgment, that since Sandy Hook seems to be out of the question, we have on the shoals of West Bank ample space for a quarantine establishment, without the possibility of objection from surroundings. The objection to West Bank would, perhaps, be the great cost of suitable structures. This would, in the long run, as compared with Sandy Hook—even admitting the possibility of ultimately obtaining that situation—be compensated for by the greater convenience of West Bank to the city. But even supposing such a structure to cost a half million of dollars, and built by the merchants, the amount would then be small as compared with the burdens they have sustained by the detentions of the present system."

I was the more familiar with this site from observation nine years before, while in the Navy, and temporarily attached to the Legare, on coast survey service in this harbor.

On making my views known to State Senator Henry C. Murphy, who was a resident of Bay Ridge, he formulated them into a bill for a new quarantine law, designating West Bank as the site for the needful structures, and introduced it in the Senate. But

the proposition was ridiculed by leading members, who declared that one stone could not be made to lie upon another on West Bank. The Senator's confidence in my knowledge, however, was not shaken. He appealed to me for suggestion how to overcome the opposition. It was: Strike out the words "on West Bank" and let the provision "in the Lower Bay of New York" stand, and insert "not on Staten Island, Long Island, or Coney Island," and, I added, the next epidemic that comes (there was none pending at the time), will force the terms—West Bank can again be inserted. As thus modified the bill became a law—the quarantine law of 1863. It explicitly provided for the use of steam as a disinfectant, but it was found to be impossible to satisfy the "engineers" of the legislature, without including a section of the old law authorizing thirty days or more detention of vessels that had had infectious disease on board. (As will presently appear, my prediction with regard to the future was verified.)

In 1865 "thirty-six vessels arrived from European ports, at or adjacent to which cholera was known or reported to prevail, and were "detained in quarantine, 'according to law,' for observation, fumigation and purification," at great expense to the merchants. Among them, the steamship Atalanta, with a large number of steerage passengers, from among whom sixty deaths from cholera had occurred during the voyage. She was disinfected by Prof. R. Ogden Doremus, with chlorine, described in his own words, as follows:

"Rolls of sheet lead were taken on board, with hundreds of pounds of common salt and peroxide of manganese; also carboys of sulphuric acid. The lead was unrolled, turned up at the edges, so as to make receptacles eight or ten feet in length and four feet in breadth, in the hold. Into these troughs the salt and the manganese were mingled with water, forming a black mud, and when all were ready to leave the hold, a carboy or more of sulphuric acid was poured into the mixture. Huge volumes of chlorine were immediately given off; hundreds of pounds of this greenish-colored gas arose and diffused in every direction. The hatches were 'battened down' and this potent element was left to accomplish our purpose, viz., to dehydrogenate, and thus decompose the death-breeding gases and germs."*

Doubtless this ship was disinfected of *cholera* by this means (though she was subsequently detained thirty days in quarantine),

*Sanitarian, vol. vii., p. 314.

because there is no reason to suppose that the bilge was infected with cholera germs. Had it been, they would have been perfectly safe from injury, because unexposed. The gas surely did not go through the planking. The Professor was, indeed, like the Health Officer under whoseauspices he operated, too little acquainted with the structure of a ship to know that the bilge and limbers—the specially filthy recesses where disease germs lurk—were as effectually protected against the emanations from five hundred pounds of chlorine-gas salts as they were from the emanations of the mere platefuls ordinarily used. Though from what we have since learned of the nature of cholera germs, there is no reason to suppose that they ever find their way into the bilge and limbers. Not so, however, with regard to yellow fever germs, with which ships have become infected by lying in the waters of infected ports, into which the sewage is discharged—such ports as Havana and Rio de Janeiro.

Straightway, on the introduction of this epidemic (1865), the effort of the Health Officer was revived to locate the quarantine structures on the shores of the bay, notwithstanding the prohibitory clause of the law of 1863—"*in the Lower Bay* of New York, *not on Staten Island, Long Island, or Coney Island.*" His effort was effectually resisted at every point.

Soon after the legislature convened, January, 1866, a bill was introduced, amending the law of 1863, reinstating "on West Bank," and repassed April 21, providing for the erection of suitable structures and equipment, as provided in the organic law of 1863, but only *just now*, as it were, approaching completion.

In June following, with a view to the equipment of the establishment and improved methods of disinfection, I urged Dr. John Swinburn, the Health Officer of the Port (and also member ex-officio of the Metropolitan Board of Health, then just organized), to provide me with the means to institute experiments for the purpose of demonstrating the applicability of steam as a disinfectant. He placed at my disposal a small engine, so nearly worn out that it would only sustain thirty pounds boiler pressure at the outset, and with needful let off, would run down to ten pounds in ten minutes. However, after considerable hesitation, the experiments were undertaken. To help out the power of the engine, I had a coil of iron pipe, 356 feet in length, encased in a brick closet, with fire-placed underneath, as a superheater. Over this a chamber of 500 cubic feet capacity was constructed, with the distal end of the

super-heater pipe communicating. The chamber was formed in the jamb of an old factory chimney of rough brick, forming two sides; the other two sides, floor and roof, were constructed of unplaned pine boards. An opening was made on one side into the old chimney flue, to which a trap door was fitted, with a string extending to the outside, so as to admit of opening and closing at will, on first letting in steam, to drive out the air and then close. Thus constructed, three thermometers were arranged: One, self-registering, suspended midway from floor to roof, six inches from the brick wall; one near the top, and the third near the floor—both these with bent tubes, the exposed bulbs extending into the chamber, and the scales outside. Two basins of water, of two quarts each, were placed, one on the floor, and the other on a bench, midway from floor to roof, in the middle of the room. A few clams, oysters, eggs and small fish, some wrapped in blankets, wet and dry, and others fully exposed; also a pair of linen pantaloons, and a clean, starched shirt, were placed on benches. The temperature of the water in the basins was 75°, and of the room 80°. The proximal end of the superheater pipe was connected with the steam cock of the boiler, the door closed and steam let in under thirty pounds pressure—a bright fire burning under the coil of pipe. The trap door in the chimney was kept open for three minutes and then closed. At the end of ten minutes the steam pressure had run down to ten pounds. It was cut off and the room opened. The thermometers meanwhile having run up, the one at the top to 224°, the one at the bottom 205°; and the register of the self-registering one marked 210°. On first opening the chamber the floor was quite wet, but it was so hot that in about ten minutes the moisture had all evaporated. The water in the basin on the floor was heated to 162°, on the bench 150°. All the edibles that were not wrapped, were thoroughly cooked; those in the blankets only partially cooked, and about equally in the wet and dry wraps. The clothing was dry and in as good condition as when it was put in the chamber; it was only very hot.

The experiment was repeated ten times, with slightly varying results, the average of which were: Registered thermometer 210°, thermometer near the roof 200°8, near the floor 187°5. A month later, July 9th and 10th, I obtained privilege as follows, and invited the Board of Health to witness the experiments:

A fire engine capable of sustaining a boiler pressure of 160 pounds, and above forty pounds indefinitely with sufficient escape;

and hard by, the use of an old fire engine room, recently used as a dog kennel, of 4,240 cubic feet capacity. The floor was littered with about a cart load of straw saturated with moist dog filth, offensive in the extreme. At each end of the room were loosely fitted double doors, twelve square feet in extent—those at one end were half glass. Horse blankets were hung over the crevices and the glass. Thermometers were placed—a self-registering one, suspended three feet from the floor, middle of the room; and another, wrapped with eight folds of heavy horse blanket, on the floor; two with bent tubes and bulbs extending one foot from the wall, inside, and scales outside; one three feet from the floor and the other three feet from the ceiling. The room was wainscotted with pine boards, painted, four feet from the floor; above and the ceiling, lime plastered wall. Height of room from floor to ceiling, eleven feet. The average temperatures of seventeen experiments, keeping steam up for twenty minutes, were: Register thermometers—showing the highest obtained—the one exposed 177°, the one wrapped 155°; highest point of lower thermometer 155°7, upper 153°6; temperature of the air 80°. Much steam escaped from the room despite the effort to retain it—particularly from the crevices at the top of the doors. Special experiments, besides: The first, connected with the superheater coil, into which eight ounces of (pure) carbolic acid, diluted with a quart of water was poured, just before attachment, with a view to deodorizing the filthy straw. Steam was let on at full pressure and with a bright fire under the superheater. It was kept up one hour, when the doors were opened. In less than five minutes the hot mist was cleared away and the room entered. There was no disagreeable odor, and but a faint odor of the carbolic acid. The walls and ceiling were perfectly dry; the paint on the wainscotting and doors blistered, and rosin started from the pine knots. The highest temperatures observed by the thermometers were: The upper one 180°, the lower one 186°. Registered thermometers—suspended, 188°; wrapped, 190°. The filthy straw, now rendered entirely inoffensive, was removed. The following day the seventeen experiments mentioned, were exclusive of the superheater. But following these, after covering all the escape holes as completely as practicable, wishing to further test the permeability of the textiles —making extra wrappings of the registering thermometers, one with dry and the other with wet horse blanket *sixteen fold*—placing the others as before; leaving my silk hat, and placing several

other articles of clothing, eggs and clams—some freely exposed and some covered—in the room. Connection was again made with the superheater and steam let in, and kept up for one hour. The lower thermometer ran up to 190°, the upper one to 200°; the one in the dry blanket registered 190°, the wet 175°.

The hat and articles of clothing were dry and unfazed, and the edibles much over-cooked.

The record made at the time states: "The only apparent benefit of the superheater in these experiments consists in the maintenance of a more steady high temperature." But it is evident that the steam was not superheated at any time—did not reach the temperature of boiling water.

These experiments were in part witnessed by the late Jackson S. Shultz, at the time President of the Metropolitan Board of Health, and Prof. Doremus, Chemist to the Board. But they, as did Dr. Swinburn, regarded them as failures, unworthy of further attention.

December 16, 1867, Ralph Chandler, Commander, U. S. Navy, and at time in command of the U. S. steamer Don, from Santa Cruz, W. I., reported to the Secretary of the Navy: * * * * "On the 26th of November, yellow fever broke out on board the vessel in its most violent form. * * * On arriving here the sick were at once landed. * * * The ship was thoroughly impregnated with yellow fever. * * * I caused the hatches of the berth-deck and ward-room to be securely closed and battened down. One joint of the steam-heater on the berth-deck was disconnected, and the same operation performed in the ward-room. A thermometer was lowered through a small slit in the tarpaulin, and, after two hours steaming in the ward-room, it indicated 205°, and on the berth-deck 172°. I am under the impression that the true temperature was at least ten degrees above these figures, as the act of bringing the thermometer in contact with the air above caused it to fall too quickly for an accurate observation. The hatches were then opened, decks dried down, the joints of the steam-heaters replaced and steam turned through the heaters, and in two hours there was no indication of the extreme heat those places had been exposed to, except blistered paint and a few articles of furniture that were glued had fallen apart. * * * It affords me much happiness to state that no new cases of fever occurred. * * * We had 23 cases, and seven died. * * * This is the third yellow fever ship that I have served on board of,

but I have never before seen the disease in so violent a form.* * * I have the honor to inform the Department that I am fully persuaded that heat eradicated the disease on board this vessel, and I would respectfully recommend that vessels of war destined to serve on the West Indies Station be provided with means of steaming the lower decks and holds."

Nevertheless, the old quarantine laws generally still obtained. And nowhere more odiously than at New York. Their enforcement was at the option of those to whom they were entrusted; and, unfortunately for some communities, those to whom their administration was entrusted chose to be purblind to their useless obstruction to commerce and their worse than useless means for their pretended purpose of protecting the public health. All competent observers since 1831-33 had ceased to have faith in quarantine, according to its original significance, because—notwithstanding its most rigid enforcement—it failed to keep the cholera out of Europe, England and the United States. Hence, in England, there was scarcely an effort to enforce quarantine against the subsequent invasions of cholera in 1849, '53, '65 and '66. It was indeed, declared to be useless by the General Board of Health as early as 1848. But the laws still remained on the statute books. They were appealed to, for the last time, in England, against the spread of yellow fever in Swansea, introduced by an old wooden and badly-infected ship, in 1865. A number of cases occurred among the people, fifteen of which were fatal. But all the cases were traced to *communication with the ship*—than which there has rarely been a more flagrant example of neglected disinfection and misapplied effort to restrict disease. But here, as elsewhere, it was evident that the repeated demonstrations of practical disinfection with steam, and numerous experiments showing the facility of its application, as above referred to and in part described, were premature. Even in England the old laws and regulations were not abrogated until 1872. The new law of that date has been amended several times since, until it comprehends all the instrumentalities essential to effective port sanitation: Hospital accommodation for infectious diseases; means of transporting cases to hospital and officers from ship to ship; apparatus for disinfection, together with needful provision against the landing of rags or other things liable to infection, from infected ports. And the medical officer of health is required to take such steps as may appear to him to be necessary for preventing the spread of infection.

The general recognition of steam as a prompt and efficient disinfectant awaited the demonstrations of practical biology—*the discovery and actual submission of disease germs to its influence.* Considering the poison of communicable diseases to be organic, I had from analogy, deduced the conclusion that its vitality was destroyable by a steam heat of a temperature sufficiently high and kept up long enough to coagulate albumen, 145° Fahrenheit, as early as February, 1864.* But my conclusion was far from being accepted. Even those who accepted heat as an effective means of disinfection, contended for it at a temperature of 300° and upwards —until about ten years ago—a temperature so high as to be destructive to textile fabrics, and consequently very limited in its practical application.

Indeed, the practical use of steam as a disinfectant in port sanitation, and otherwise, was not generally accepted, until after the meeting of the American Public Health Association in Memphis, in 1887. It was then that Dr. George M. Sternberg, Chairman of the Committee on Disinfectants, reported that:

"A temperature of 56° C. (132°.8 F.) is fatal to the bacillus of anthrax, the bacillus of typhoid fever, the bacillus of glanders, the spirillum of Asiatic cholera, the erysipelas coccus, to the virus of vaccinia, of rinderpest, of sheep-pox, and probably of several other infectious diseases.

"A temperature of 62° C. (143°.6 F.) is fatal to all of the pathogenic and non-pathogenic organisms tested, in the absence of spores (with the single exception of *sarcina lutea*, which in one experiment grew after exposure to this temperature).

"A temperature of 100° C. (212° F.) maintained for five minutes destroys the spores of all pathogenic organisms tested."†

In the discussion on cholera that followed Dr. Sternberg's report, I described the then condition of the New York quarantine plant and the extemporized apparatus, used only ten days before, by which the personal effects of 600 steerage passengers from the cholera-infected ship Alesia were disinfected with steam, and cholera stamped out from among them: First, by disinfecting all personal effects of the passengers except the clothing they had on; next, as soon as this disinfected clothing was dry enough to put on, requiring of every one of them on removing his or her clothing, a mercuric bichloride bath before donning the clean clothing

*"Disinfection."—Transactions Medical Society of the State of New York.

†Public Health, vol. xiii., p. 98.

—the unclean, just taken off, being at once put into the disinfector. This work was accomplished within twenty-four hours. Temperature applied, 212° to 220° F.; time to each lot, twenty minutes. Subsequent to this there was not another case. The Britannia was disinfected with steam from her own engine, in the same manner as Commander Chandler had disinfected the Don of yellow fever.

There had been a number of steam-disinfecting inventions and contrivances constructed during the period subsequent to the first use of steam as a disinfectant, nearly forty years before, but, with but one exception they were of but little scope and not at all adapted to port sanitation. The exception referred to was at New Orleans, the conception of Dr. Joseph Holt, then President of the Louisiana State Board of Health, and constructed under his supervision in 1884; primarily, however, without reference to the use of steam as a disinfectant, of which he confessedly had no knowledge at the time, but for the use of *Bichloride of Mercury.* As described by himself:

"The idea of using this agent as a disinfectant in municipal and maritime sanitation suggested itself to me while reading the chapter on 'Wound Disinfection—Antiseptics,' in the volume entitled 'The Treatment of Wounds,' by Lewis S. Pilcher, M. D.' "

He had found all the means in common use for the disinfection of vessels, and he happily hit upon this, which proved to be eminently efficacious to the extent of its application. His directions were: "Take five and a half ounces each of bichloride of mercury and muriate of ammonia (the latter to act as a solvent), and dissolve in a half gallon of water; add this to forty gallons of water in a cask. I have sent three large watering pots, with a fine rose or spray. Your men can quickly wet down a ballast pile and all *available surfaces* of a ship, and it needs no repetition when once *thoroughly applied.*"* (Italics ours). But steam had now (1887) found a substantial basis, and no one was quicker to appreciate it than Dr. Holt. The efficiency of the bichloride solution was sufficiently manifest to justify an elaborate contrivance for its use, which contrivance, together with an extensive fumigation plant for evolving and driving concentrated sulphurous acid fumes into recesses that could not be washed down or sprayed with the bichloride solution, only required additional elaboration to render steam available also. The salvation of New Orleans—so long in jepordy

*Public Health, vol. xiii., p. 164.

by recurring epidemics of yellow fever—was his well appreciated aim by both public sentiment and public authority, and his energy eminently justified the confidence reposed in him. He wasted no time in showing that the confidence was right worthily placed. However efficacious the means he had devised, he was not so exclusively wedded to them as to be purblind to improved methods. In less than two years thereafter he had contrived the most complete steam disinfecting plant hitherto constructed. Just after the meeting of the American Public Health Association, at Toronto, October 15, 1886, he wrote:

A. N. BELL, M. D., Editor *The Sanitarian:*

* * * After my conversation with yourself and Drs. Sternberg and Rohé, I became fully convinced of the utter uselessness of retaining a complicated piece of work as a part of the steam-disinfecting apparatus. Your views, then and heretofore expressed, of the entire sufficiency of the moist heat of high temperature, as in itself a potential agent of the most decisive kind, squares so entirely with my conviction, based upon its practical operation, that I am willing to rely upon that single agent in our treatment of clothing, baggage, ship's linen, etc." Under the same date he wrote to Dr. Thos Y. Aby, Resident Physician, Mississippi Quarantine Station:

* * * "There was a general consent to the opinion already reached by you and myself, that the bichloride of mercury atomizing apparatus was unnecessary, and therefore a useless complication for two sufficient reasons:

"1. That the high degree of moist heat attained was in itself as reliable and complete an agent of disinfection as could be devised.

"2. The lack of proof that the steam, charged by atomizing with the bichloride solution, applies the metallic agent equally throughout all parts of the chamber, and in strength such as to guarantee protection from this agent alone.

* * * "It is a useless expenditure of time and material to continue further any part of the process other than the steam of not less than 226° Farenheit, which will certainly preclude the necessity of an aditional agent."*

And here it may be remarked that the sanitation of vessels on departure from an infected port, was first instituted at New Orleans, when yellow fever existed there in 1879, through my instrumentality, under the auspices of the National Board of Health.

*Sanitarian, Vol. xvii, p. 33.

Under Dr. Holt's administration the practice was extended to Central American ports, in communication with New Orleans. The practice was followed by the U. S. Marine Hospital service, first in Havana, and subsequently, at European ports, with reference to cholera in 1892. Dr. Jenkins, Health Officer, Port of New York, also employed inspectors in European ports during the prevalence of cholera 1892-'93.

The construction of the artificial island on West Bank, in the Lower Bay of New York, as the site of the quarantine establishment, was begun in 1866. The hospital—a combustible wooden structure—was reported for use, and first occupied in 1870. Early in that year I had been appointed Supervising Commissioner of Quarantine, and one of my first acts was to have a steaming chamber and tub attached to the hospital for the disinfection of hospital clothing. This was the only device and the only means of disinfection, with steam, in the institution, until, as above described, in 1887.

Meanwhile, the two islands, one for the hospital and its needs, and the other as a place of detention of persons who had been exposed to communicable disease, until the period of incubation had passed, had been completed; and buildings, upon the detention island partially completed. Subsequent to which time, 1874-1887, in default of needful appropriations, the structures had been allowed to decay—insomuch that when the cholera-infected ship Alesia arrived, with over 600 steerage passengers, it was a serious question with the Health Officer, Dr. Wm. M. Smith, whether their lives would not be in greater danger if transferred to the island in its then condition, with plank walks in decay and the buildings but very partially and altogether imperfectly equipped with plumbing facilities, than to keep them on board ship. However, he had them transferred. Cholera continued among them with less than five days' interval between the occurring cases for three weeks. He had had two chambers constructed and used for plenary sulphur-fumigation, to which the personal clothing was submitted for many hours, but with no apparent effect. The already rotting wood, littered soil, and the rip-rap around, was becoming filthy and offensive. This was the dilemma with which he contended. Fortunately the hot sun-shiny weather effectually nullified the danger from the surface filth. But, considering all the conditions and embarrassments, if there has ever been a more signal triumph of port sanitation than this was, we have no knowledge of it.

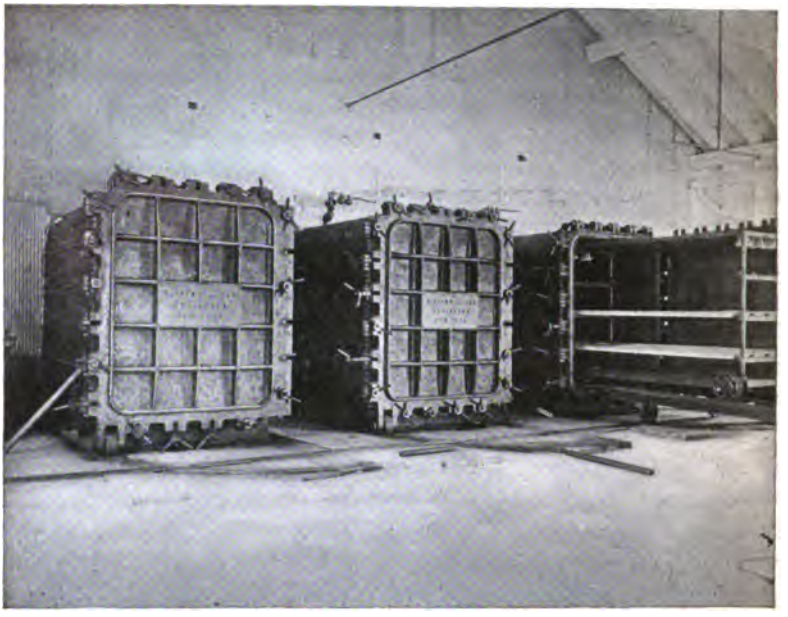
The danger of this arrival—so greatly enhanced by the disgraceful condition of the quarantine establishment at the time of its occurrence—was not appreciated by those in authority until it was over. The Health Officer had, for several years, urged the necessity of repairs and equipment of the establishment, and bills making appropriation for the purpose had passed the legislature for several consecutive sessions. But for political reasons the Governor had, as often, vetoed them! A committee of the New York Academy of Medicine, the late Dr. C. R. Agnew, chairman, aroused public sentiment against the neglect. Early in the session of the next session of the legislature, 1888, a bill was passed and approved by the Governor, making appropriation for repairs and additions, including a steam disinfecting plant. They were made and effectually fulfilled their purpose until the extraordinary advent of cholera at this port in 1892, the history of which is widespread. The inadequacy of the site and equipment were abundantly manifest. But the threatened invasion was successfully resisted. Under this spur, there was no difficulty in securing the needful legislation for future protection.

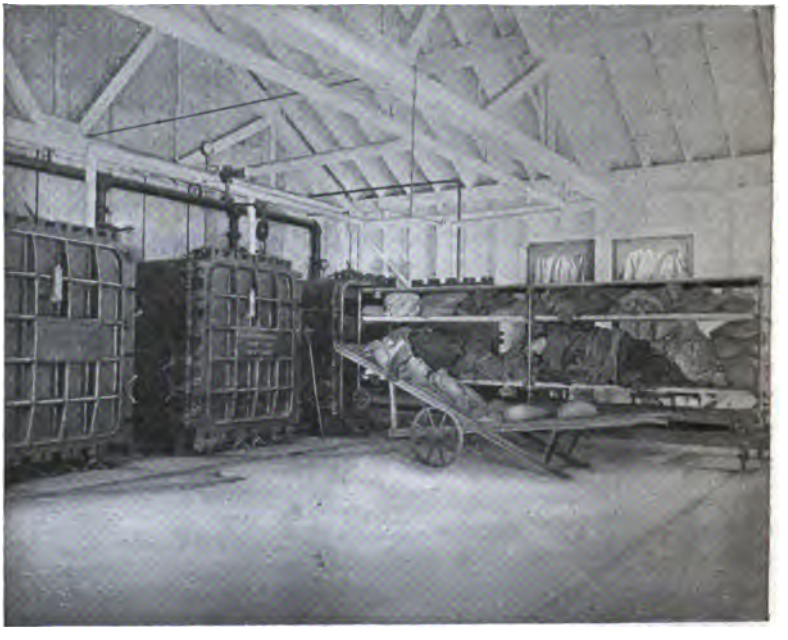
To Dr. Wm. T. Jenkins, the Health Officer at the time, the credit belongs for devising one of, if not indeed the best arranged and most elaborate steam-disinfecting plants, hitherto constructed. His own description of it and of other plants which he examined, which lead to its adoption, is as follows:

"After a thorough examination of the construction of several well-known disinfecting plants, it was found that there were several important points that were not considered in their construction. The most important, and the one which was the greatest objection to the existing plant of 1892, was that no division was provided between the portions of the room from which the infected material was taken and the portion to which the material after disinfection was removed. This was a grave fault of the old plant, which, in addition, was located on the second floor of the building containing the boilers, where it was difficult of access. It opened into a hallway, where it was impossible to handle the disinfecting material without passing it through the same passage by which it was brought for disinfection, rendering it subject to contamination from any infected material which might be present for disinfection. This was fully understood by me in 1892, when the plant was taxed to its utmost capacity, making the work of disinfection necessarily slow.

"Another difficulty in the contemplation of the several designs inspected, prior to the construction of the new plant, was the light weight of the iron or steel used in the manufacture of the chambers. The architect taking into consideration these and other important items suggested by me, drew the plans and started the work of a new disinfecting plant on Hoffman Island in June, 1893, and, at this writing (March 20, 1896), the plant is complete. Adopting his description, I will say that there are three chambers constructed of five-sixteenths-inch steel. Each chamber is four feet wide, five feet high, inside measurement, and sixteen feet long, with a full-sized heavy cast-iron ribbed door at each end securely hung on heavy cast-iron hinges. The extreme weight of these doors requires them to be partially carried by rollers moving on a quadrant or flat iron track. Each door is provided with twenty-one one and one-eighth-inch diameter eye bolts with levers and nuts for fastening and securing the doors while a pressure is on the chambers. The frame on the chambers is fitted with a gasket of lead for the purpose of making a complete tight joint between the chambers and the doors. Each chamber is constructed on the jacketed principle, thus utilizing the jacketed space for what is known as dry heat disinfection. This jacket will sustain a pressure of from one to sixty pounds of steam to the square inch. The steam piping has been constructed in such a manner that the pressure may be reduced or increased as desired, both on the inside of the chamber proper and the jacket space. The steam supply to each chest is controlled by these valves only, thus avoiding complications. The inner portions are provided with perforated spray pipes for the purpose of heating with moist steam. In the construction of these chambers the intention was to obtain a temperature in them of from 212 to 220 degrees Fahrenheit; but the actual test proves, that, in from thirty to forty minutes after the time the doors are closed, a temperature of 240 degrees Fahrenheit can easily be obtained. This temperature was raised without the use of the vacuum pumps. If so desired the vacuum pump can be brought into operation and a vacuum of from ten to fifteen inches can be raised in the chambers.

"A galvanized corrugated iron partition separates the infected from the disinfected portions of the building. The intake doors of the chamber are located on the infected side of the partition, and the outtake doors of the chamber are located on the disinfected side of the partition. This partition is made as nearly airtight as





possible, and a proper method of communication has been provided for the attendants by means of speaking tubes, and those engaged on the disinfected side are, by these means, perfectly isolated from those employed among the infected baggage of the passengers.

The vacuum pump and all the fixtures that are required to operate the three chambers, are located on the infected side of the partition, which divides the building and prevents personal contact between the infeçted and disinfected portions of the plant. Each chest is provided with a high temperature thermometer with a metal bulb and protecting collar extending through the door of the chamber. The combined apparatus is considered to be capable of disinfecting the baggage and clothing of 2,500 or 3,000 immigrants in less than twenty-four hours.

"Upon this island, Hoffman, the facilities for bathing are such that each person who is sent to this plant for observation, because of his exposure to contagious or infectious disease on shipboard, shall receive a thorough cleansing and have his clothing sterilized before entering upon the period of detention.

"The bath facilities here referred to are located in a building on the north pier of Hoffman Island."

For the illustrations, the writer is under obligations to Dr. A. H. Doty, the present Health Officer, under whose auspices a *floating disinfecting plant* has been devised, eminently suited to some conditions facilitating the least possible delay of persons and things that have been exposed to infection.

Moreover, to Dr. Doty belongs the credit of having secured the needful appropriation for doing away with the old wooden shanty-like hospital, and the erection of a new fire-proof structure instead—now nearing completion.

Approximating, if indeed not quite equal to the steam-disinfection plant of the New York Quarantine, the U. S. Marine Hospital Service, under the direction of Surgeon-General Walter Wyman, has constructed several plants. The most recent, and one of the most complete, being at Essington, on the Delaware, below Philadelphia.

The plant on the St. Lawrence, below Quebec, constructed under the direction of Dr. F. Montizambert, General Superintendent of Quarantines, is an admirably devised plant, barring the need of division partition, separating the employes and material handled—those handling infected material on one side from those receiving the disinfected on the other.

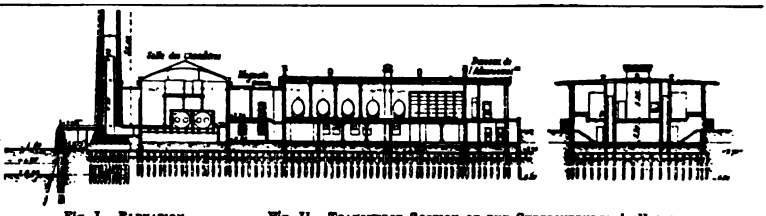


Fig. I.—Elevation. *Salle des chaudières* = Boiler house.

Fig. II.—Transverse Section of the Superintendent's House. *Magasin* = Store. *Bureaux de l'Administration* = Offices.

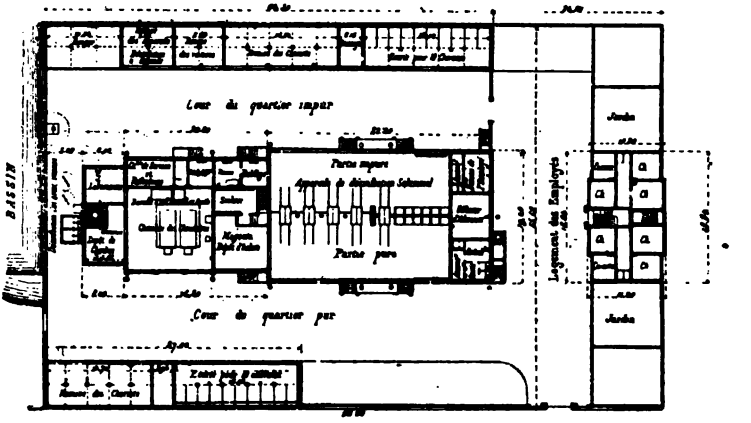


Fig. III.—Plan of Ground Floor.

Bassin = Canal basin. *Désinfection des eaux vannes* = Sterilising apparatus for effluent water. *Dépôt de charbon* = Coal store. *Cheminée* = Smoke-stack. *Laboratoire* = Laboratory. *Chambre de Service et Réfectoire* = Refectory. *Deshabillage* = Undressing-room. *Rhabillage* = Dressing-room. *Bains* = Baths. *Chambre des chaudières* = Boiler house. *Bassins d'eau chaude et froide* = Tanks of hot and cold water. *Sechoir* = Drying-room. *Magasin dépôt d'habits* = Store-room for clothing. *Partie impure* = Disinfecting-room, "unclean" side. *Partie pure* = Disinfecting-room, "clean" side. *Appareils de désinfection Schimmel* = Schimmel's disinfectors. *Officier d'Administration* = Managing official's room. *Bureau de l'Employé* = Clerk's office. *Ascenseur* = Lift. *Antichambre* = Antechamber. *Cour du quartier impur* = Courtyard, "unclean" side. *Cour du quartier pur* = Courtyard, "clean" side. *Hangar* = Shed. *Remises des Appareils Désinfection à domicile* = Store for house-disinfecting apparatus. *Remise des voitures* = Coach-house. *Remise des chariots* = Van shed. *Fourrage* = Forage store. *Ecurie pour 10 chevaux* = 10-stall stable. *Logement des employés* = Attendants' Apartments. *Ch.* = Room. *Cuisine* = Kitchen. *Jardin* = Garden.

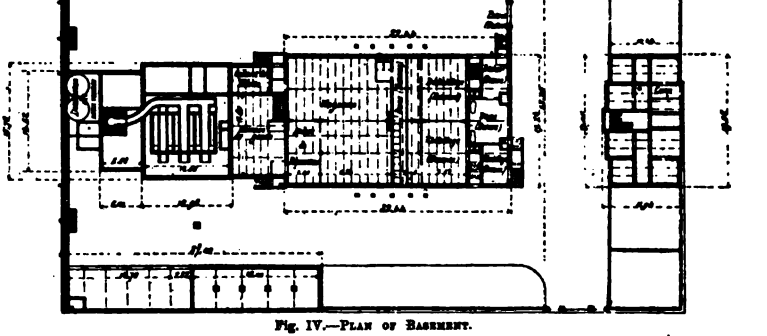


Fig. IV.—Plan of Basement.

Cabinet de toilette = Dressing-room. *Hommes de garde* = Attendants'-room. *Magasins* = Store. *Atelier de réparations* = Repairing shop. *Bains (hommes, dames)* = Baths (males, females). *Deshabillage (hommes, dames)* = Undressing-rooms (males, females). *Rhabillage (hommes, dames)* = Dressing-rooms (males, females). *Entrée (dames)* = Entrance for females. *Caves* = Cellars.

N.B.—All dimensions are given in metric scale.

Of foreign plants, that of Hamburg, is the most complete of any of which we have a published description. As described by a recent number of *Le Genie Civil*: It occupies a rectangular area 88 by 56 metres, and is situated in the southeastern quarter of the town, in the neighborhood of the chief centre of epidemic diseases. Being built on the banks of a canal basin, water communication is available, and a crane is provided for unloading the articles to be disinfected, which when purified can be reshipped from a separate wharf.

It being considered that disinfection, to be of any value, must be performed thoroughly, which cannot be the case if the same vehicles and attendants are used for collecting and delivering the goods unless they too undergo a process of disinfection, the establishment is divided into two entirely separate and distinct portions, and it is impossible for attendants to get from the "unclean" to the "clean" side without passing through a disinfecting chamber, where they must undress, wash, take a bath and put on special or disinfected clothes.

The apparatus (Schimmel's disinfectors), consisting of five ovens, is fixed in the longitudinal wall separating the disinfecting house into the two divisions specified.

Beyond this section is a portion set apart for the attendants engaged in the "unclean" division of the premises. Here there are a refectory, an undressing-room, bath-room and dressing-room where the attendants put on their special dress. On finishing their labors they pass through these rooms again, but in reverse order.

In the "clean" section the attendants, having only to deal with purified articles, are not subjected to the same restrictions.

The basement contains two distinct sets of baths, with separate entrances and exits, respectively for male and female attendants, or sufferers from infectious disease, or officials who have been engaged in house disinfection. Meanwhile their clothes are being disinfected in a special oven.

The building is constructed of brick, and surmounted by a flat roof covered with wood cement. All the floors are cemented except those of the dining-rooms, and the walls of the principal rooms, bath-rooms, dressing-rooms, etc., are constantly covered with a coating of linseed oil. The walls of the disinfecting house are lined with glazed tiles, the others being merely cemented.

Separated from the main building by the broad carriage-way is a smaller edifice, containing apartments for the superintendent and a portion of the staff.

The whole of the effluent water from the premises is sterilized before being allowed to pass into the sewers.

In addition to this establishment, which cost in round figures 200,000 marks (£10,000), with a further 30,000 marks for the apparatus, two others have been erected (near the Eppendorf hospital and the Lohmühlenstrasse respectively) for the treatment of linen from the hospital. The disinfecting vats of wood are placed in the longitudinal wall dividing the room, and the covers are so arranged that only one can be opened at a time, thus preventing direct communication between the two sides of the premises. The linen is put into hot water, which is slowly raised to the boiling point, and at the end of a further ten minutes is taken out and washed, Dr. Rumpf having found that this treatment, in presence of a 5 per cent. solution of soap, sufficed to kill the most obstinate germs.

Disinfection of Soiled Linen.—Beyer (*Fortschrit. de Médicine*, No. 1, 1897), has tested different methods employed for the disinfection of bed linen and underclothing. The ordinary methods by boiling are not suited to these articles, as the presence of blood, pus, and feces causes an ineradicable stain if a high temperature is used. Soaking the garments in solutions of various soaps for one or two days failed in every instance to kill cholera, typhoid, and pyogenic organisms which were mixed with the feces with which the garments were smeared. In some cases the germs were killed when the solutions containing the linen were kept at 50° C. for a few hours. With lime-water the results were much better. Sample garments which were soaked in this solution for twenty-four hours were found to be sterilized. An equally good result was obtained in a hospital where about one-half a cubic meter of soiled linen was soaked in lime-water for forty-eight hours—or for twenty-four hours if the clothing was first rinsed with lime-water and then placed in a fresh solution. The lime-water does not injure linen or cotton goods, but shrinks woolen to such an extent as to prevent its use.

AGGRESSIVE SANITATION.

THE RECENT MEASURES OF THE NEW YORK BOARD OF HEALTH TO ELIMINATE INFECTIOUS DISEASES FROM THE PUBLIC SCHOOLS.

EDITOR OF THE SANITARIAN: Gratified as I have always been with the aggressive spirit of THE SANITARIAN, as constant reader from the outset, I avail myself of the occasion to express my special appreciation of your remarks on page 466 of your May number, with reference to the obstacles with which the Board of Health has to contend in its progressive work, and to jot down a few reflections on the most recent "innovation" of the rights of people to propagate disease.

For several years past it has been observed that among the school children of public, parochial and industrial schools, there could always be found some form of contagious or infectious disease.

Measles, scarlatina, in the desquamative stage, mumps varicella tinea capitis, itch, and animal parasites were not infrequently detected.

The numerous loopholes through which many of these diseases were found to spread, notwithstanding the official precautions insisted upon by the various methods of isolation instituted by the Board of Health, seemed to be almost impossible to control. The apparent ignorance of and popular indifference to preventive methods against the spread of these diseases have always, heretofore, been the greatest obstacle to the efficiency of official effort in the control or suppression of communicable diseases. Unfortunately, no such dread of these exanthems, so common to childhood, is popularly felt as is felt with regard to smallpox; and it is with the greatest difficulty that persons of intelligence can be convinced of the possibility of controlling the communicability and propagation of these diseases. To the common idea among many people that such diseases are an unavoidable heritage of childhood and youth, may be attributed the chief difficulty of controlling them by the health authorities. Not alone is ignorance at fault, but indifference and selfishness on the part of some of the well-informed, also refuse acquiescence and even oppose the use of proper means for their prevention. Isolation of the person and prophylactic measures for public protection, are looked upon as largely interfering with personal liberty and inalienable rights.

In the schools may be found the most indubitable evidences of both this indifference to the welfare of others, and of the ignorance of parents regarding the spread of contagious diseases. A child just recovered from a mild attack of scarlet fever, whose cuticle is desquamating, another with the parotid glands swollen, or another with a few well-marked vesicular papules on the face and body, or one with symptoms of coryza accompanied with hoarse cough, slightly febrile, in a word—suffering with incipient measles in its most infective stage; others with well defined tinea of scalp or skin, and again others with indubitable scabies, to say nothing of the parasitic animals evident on the hairy scalp, are by no means uncommon sights on looking over classes of school children.

Heedless and indifferent to the rights and welfare of others, parents selfishly send such cases into the schools where multitudes of well children must be exposed.

Until recently no special efforts have been made to check this indiscriminate exposure and heedless propagation of infectious diseases. The anxious parent desires his children to be in school, the law requires no truant to escape, so the doors of the great school buildings are thrown wide open to receive and, unfortunately to over-crowd and pack the children of school age into these human hives without a thought of the dangers involved. Germs of contagious diseases enter into the bodies of children more insidiously and, under such conditions, with more favorable receptivity, than mental pabulum or its improvement. The more crowded these youthful multitudes, the greater the opportunities for contracting and disseminating preventable diseases.

To prevent this means of propagating disease, the New York Board of Health has recently instituted a daily medical inspection of school children, *in the schools*, and although the system is not yet perfected, the results from the outset have shown the great importance of the measure as a means of preventing the spread of contagious diseases. Parents are quickly appreciating the necessity of keeping infected children at home and of greater care of their persons; and a higher appreciation of the rules and advice of the Health Officers.

As may be seen by the report of the Chief Inspector of the Medical School Inspection, for the week ending April 9th, 364 children were found to be affected with infectious diseases, and excluded from the schools, out of a total of 7,398 examined—over 4 per cent—as follows:

Number of males examined, 3,316; females, 4,082; total, 7,398. Number of cases of measles, 3; diphtheria, 13; scarlet fever, 1; croup, 3; whooping cough, 4; mumps, 10; contagious eye diseases, 59; chickenpox, 15, and skin diseases, 19.

With this system further extended and perfected, not only the sickness rate but also the death rate will doubtless be reduced. It will also promote the intelligence and education of the people on the necessity of greater care of such cases occurring in their families, and may we not anticipate the possibility of stamping out in the near future some, at least, of these devastating diseases of childhood.

New York, May 7, 1897. OLD INSPECTOR.

VENTILATION OF SCHOOL-HOUSES AND OTHER PUBLIC BUILDINGS.

One of the most important laws enacted by the recent session of the Legislature of New York emanated from the Manufacturers' Association of Kings and Queens counties—an amendment to the public health laws of the State, adding to chapter 661, at the end of article 12, several sections, in part as follows:

Sec. 211. It shall be the duty of the Board or Department of Health or Health Commissioner or Commissioners of any city or town or incorporated village to inspect and supervise every public building and every school house and every public building and every school house shall be kept in a cleanly state. * * *

Sec. 212. Every public building and every school house hereafter erected shall be ventilated in such a manner that the amount of foul or vitiated air exhausted or removed shall be effected by methods positive and independent of atmospheric changes and shall not be less than twenty cubic feet per minute for each person, and the quantity of fresh air admitted shall not be less than twenty cubic feet per minute for each person that such public building or school house can accommodate; and the Board or Department of Health or Health Commissioner or Commissioners of any city or town or incorporated village where such public building or school house is located shall within one year from and after the passage of this act inspect all the buildings therein which are so used within the meaning of this act, and thereafter shall inspect every six months all buildings therein so used. * * *

Sec. 213. Whenever it shall appear to the proper Board or Department of Health or Health Commissioner or Commissioners of any city, or town, or incorporated village, upon the inspection of any public building or school house therein, erected prior to the passage of this act, that the sanitary conditions or means of ventilation are insufficient to conform to the requirements of this act; and whenever the Board or Department of Health or Health Commissioners shall determine that, because of the construction of such public building or school house, it cannot at a reasonable cost be made to conform to the requirements of this act, such Board or Department of Health or Health Commissioner or Commissioners shall issue a written order to the proper person or authority having charge or control of such public building or school house, directing that such sanitary provisions or means of ventilation be supplied, as in the judgment of said Health authorities can be accomplished and the same shall thereupon be supplied by the public authority, corporation or person having charge, owning or leasing such public building or school house.

Sec. 214. Any public officer, corporation or person neglecting for three months after the receipt of a written order from the proper Board or Department of Health or Health Commissioner or Commissioners, as hereinbefore provided, to provide the sanitary provisions or means of ventilation required thereby, shall be punished by a fine not exceeding one hundred dollars. * * *

Sec. 215. The expression, "public building," used in this act shall include any public or private building or premises used as a place of public entertainment, instruction, resort or assemblage. The expression, "school house," shall mean any public or private building or premises in which instruction is afforded to not less than twenty pupils at one time.

Sec. 216. It shall be the duty of the Board or Department of Health or Health Commissioner or Commissioners appointed to town or incorporated village to cause this act to be enforced, and whenever any of the provisions of this act are violated, to cause all violaters thereof to be prosecuted. * * * It shall be unlawful for any person to interfere with or obstruct or injure by force or otherwise any officer or employee of any Board or Department of Health or Health Commissioner or Commissioners appointed to enforce the provisions of this act, while in the performance of his or her duties, or to refuse to properly answer questions asked by

such officer or employees in reference to any of the provisions of this act.

Sec. 217. For the purpose of enforcing this act, the Board or Department of Health or Health Commissioner or Commissioners may appoint such inspectors, engineers or assistants, as may be found then necessary. * * *

SITE, CONSTRUCTION AND FURNISHING OF SCHOOL-HOUSES.

The State Board of Health of Vermont has issued the following excellent recommendations and regulations for "lighting, heating, ventilating and other sanitary arrangement" of school-houses.

In the choice of a site for a school-house, its construction and furnishings, the following directions are to be observed as far as possible:

1st. The site should be upon a slight elevation with soil dry and well drained.

2d. If in a village, it should be at a point free from noises and unsavory odors.

3d. If in the rural portion of a town, at a point free from violent winds.

4th. As near the center of school population as possible.

5th. Playgrounds should be provided for exercise and amusement.

6th. In villages, or where there is a basement, play *rooms* can be arranged. In rural houses, without basements, a shed should be provided for exercise in inclement weather.

7th. There should be plenty of pure water supplied for drinking purposes.

8th. Buildings should be so located as to secure the best light. Particular attention should be given to this in villages where the school-house is likely to be surrounded by other buildings.

9th. Care should be taken when the building is of wood to make it warm. This can be done either by using thick building paper under the clapboards, or by filling the space between the outside boarding and the lath with clean, dry sawdust.

10th. The walls of the rooms should be light grey or buff color.

11th. All doors should be hung to swing out, and in large school buildings proper fire escapes should be provided.

12th. As forty pupils are as large a number as one teacher can well instruct, the rooms should be 32 x 28 x 12 feet high, giving from 200 to 300 cubic feet of air space and 20 square feet of surface area for each pupil.

13th. The windows should be numerous, large enough, and so arranged as to give ample light to every part (and corner) of the room. The window space should be at least one-fourth of the floor space. There should be no more space between the top of the window and the ceiling than is required to finish the building, and the window sill should be four feet from the floor. The light should be arranged so as to fall upon the pupil from the left or left and back, NEVER FROM THE FRONT. There should be curtains of a grey or buff color for all windows—two to each window—hung in the centre of the window so that either the upper or lower half, or both, can be shaded.

14th. If there is no cellar under the building, there should be a space of at least two feet from the floor to the ground, and there should be windows or openings in the underpinning so that there can be a free circulation of air.

15th. If the corridors are used as coat-rooms they should be well lighted and ventilated.

16th. In rural portions of a town, there should be two out-buildings—one for girls and one for boys. They should be at least twenty feet from the school building and from each other, with a high fence between. Earth closets should be used with road dust, saw-dust or ashes, so arranged that they may be easily cleaned. In villages where water is available, there should be a system of bowls, urinals, drains and sewers, constructed according to modern plumbing rules. Closets should not be placed in basements under school-rooms.

17th. Desks and seats. The height of the seat must correspond with the length of the legs below the knees. The seat may be horizontal or slightly curved. The back should be formed of a lower convex and an upper concave portion. A desk for writing should have an inclination of about 15 degrees. The desk should be fitted to the pupil each year. A perpendicular line from the edge of the desk should project only slightly over the edge of the seat.

18th. Blackboards should be placed opposite windows, never between, and should be of a dark lusterless color. Lessons placed on the board for pupils to copy are injurious to the eyes by reason

of the rapid change of focus required from the distant board to the paper on the desk; hence, these should be avoided.

WARMING AND VENTILATING SCHOOL-HOUSE.

The heating apparatus must be of sufficient capacity to warm all rooms to 70° Fahrenheit in any weather.

Not less than 30 cubic feet per minute of pure air for each pupil should be supplied, and it should be so introduced that there shall not be uncomfortable draughts. The difference in temperature between any two points on the breathing plane shall not exceed three degrees. The ventilating flues shall be of sufficient size to readily introduce and remove the requisite amount of air from the rooms.

In rural houses of one room where a furnace is impracticable the above conditions can most economically and satisfactorily be met by the use of the "jacketed stove," Figure 1. The ordinary wood-burner box stove may be surrounded by a casing, or jacket of galvanized iron, with proper air space of six to nine inches between jacket and stove. Fresh air should be conveyed from the outside of building through a tin tube to space under stove.

The vent or foul air pipe (also tin) should be set on legs with an opening at bottom, 12 inches from floor, to run straight up through roof as high as chimney. The stove-pipe should enter this at not more than six feet from floor, passing up as far as possible before it leaves the vent pipe for chimney. There should be a door in the jacket at the rear end of the stove which can be opened for pupils to warm their feet.

A room 28 x 30 x 12 would have 10,080 cubic feet of air. Thirty pupils in this room would require at least 900 cubic feet of fresh air per minute. To supply this amount of fresh air would require a tube of 24 to 30 inches in diameter. In order to properly warm this volume of air in the coldest weather it would be best that there should be two of the jacketed stoves, each receiving fresh air through a 12 or 15-inch tube. The foul air vent should be of corresponding size. All of these pipes should be provided with dampers to regulate the inlet and outlet of air.

School directors should not only see to it that their teachers are instructed how to use these dampers properly, but should be sure that their instructions are carefully followed.

FOOD ADULTERATION AND THE PURE FOOD LAW.*

By Dr. Lee K. Fremkel, Member of the Institute.

It will probably come as a surprise to many, that the tendency existing among manufacturers and dealers to-day, to produce and sell articles of food which are either below standard, or different from what they are represented to be, is not an insignificant fact, but a condition which has developed remarkably within the past decade. If it be remembered, furthermore, that in a number of instances, the adulteration which is practised is not only fraudulent, but at the same time also a menace to the health of the consumer, it will be seen that the condition which confronts us contains the elements to create a justifiable alarm.

The cause of this remarkable state of affairs is not difficult to trace. It must be sought in the fierce competition which is so prominent to-day in all classes of trade; in the tendency of the masses to buy that which is cheap rather than that which is good; in the inability of the poor to purchase pure food at the price which is demanded for it; and lastly, in the ignorance which renders the consumer unable to discriminate between what is wholesome and what is injurious.

The extent to which food adulteration is carried in the United States is a matter of doubt. The estimates of competent authorities on the subject vary between 2 to 15 per cent. There can hardly be any question that the first figure is too low. The last is given by Mr. Wedderburn, the special agent of the Department of Agriculture, who has examined the subject very exhaustively. Good judges estimate the value of the food supply of the United States at a minimum of $4,500,000,000 annually. If we take the very conservative estimate of 2 per cent., the loss to the consumer by adulteration amounts to $90,000,000 per year. Dr. McNeal, of Ohio, estimates the annual loss to the people of the United States at one and one-third billion dollars; and to the State of Ohio, as the result of three years' investigation, a loss $78,000,000 annually, or $232,000 per day. It is immaterial for the purpose of this lecture, which of these figures is correct. Either amount is sufficiently large to

*Abstract of a Lecture delivered before the Franklin Institute, Philadelphia, February 5, 1897.—From *The Journal*, April, 1897.

prove that the actual money loss to the consumer arising from the purchase of food-stuffs other than they are represented to be, is so great as to merit attention at the hands of the individual, the State and the National Government.

Nor does it seem that the sophistication of food is confined to any particular district. The fact that nearly every State in the Union has either general or special laws regulating the sale of food, affords in itself sufficient evidence that these laws were enacted in answer to a crying need for them. Furthermore, the reports of the Commissioners, Boards of Health and other officers appointed to administer the laws in the various States, show that the falsification and adulteration are systematic and general throughout the country. What is true of the extent of adulteration, so far as territory is concerned, is equally true of the kinds of food adulterated. It would be difficult to find a single food-stuff requiring preparation to make it palatable, that has not been subjected to the skill of the sophisticator, or which, on investigation, will not, to a greater or less extent, disclose the hall-mark of fraud.

Several years ago the National Department of Agriculture, under the superintendence of its chief chemist, Dr. H. W. Wiley, instituted a series of investigations of the more common food-stuffs, such as molasses, sugar, honey, confectionery, canned goods, etc. Letters were addressed to prominent chemists in the States of Indiana, Nebraska, California, Kentucky, Massachusetts, Louisiana, Pennsylvania, Ohio and New York, with the request that they purchase samples of such articles in their respective States, examine the same and report on their condition of purity. The department at Washington at the same time conducted a similar series of tests on articles of food sold in the vicinity of the capital. The results obtained from the examination of molasses and syrup are in the main a criterion of the results found with the other articles of food examined. As a rule, each chemist analyzed fifty samples, with the following results: Indiana showed 32 samples which contained tin; of the Nebraska samples, 35, or 70 per cent. contained glucose; of the California samples, 11, or 22 per cent. contained glucose; 19, or 38 per cent. of the Kentucky samples were found to contain the same ingredient. Worthy of notice is the fact that Massachusetts, the State in which the food laws have been most rigidly enforced, showed the smallest percentage of adulteration, only 8 of the samples, or 16 per cent. containing glucose; Louisiana, the headquarters of the molasses industry, gave 16 samples adulterated, or 32

per cent.; Pennsylvania's report does not redound to her credit, as 31 samples, or 62 per cent. contained glucose; of the samples examined in Washington, of which 25 were bought in Washington and 32 in Baltimore, 14 of the Washington samples and 13 of those from Baltimore contained glucose. Furthermore, 32 of the samples contained tin and 19 copper. The samples examined in these ten sets represent the greater number of the producers to be found in the United States, and probably no better illustration could be given of the extent of food adulteration than is represented by these few figures.

The character of food adulteration goes hand-in-hand with the extent of the adulteration and the kinds of food adulterated. It is simply astounding to what extremes the rapacity and ignorance of the producer have led him in order to increase his profits. Were the adulteration entirely of such a nature that the consumer's pocket-book only was injured, it is possible that extenuating circumstances for such fraud might be found, and the offence in a measure condoned. But when substances are added to our foods which are known to have harmful effects on the human organism; when the adulteration consists of the addition of drugs and chemicals which, when taken into the system, are known to be cumulative poisons—and it has been repeatedly shown that such adulteration is practised—then we can only pray that the world at large may soon be educated up to the standard of seeing that it must, for its own protection, stamp out this evil of adulteration with every force that it can exert.

To bring this matter more clearly before you, let us leave generalities and consider in detail some of the adulterations that have been and are being practised to-day on the more common articles of food. Of these probably none are so important as the two in daily use by all classes of people of all ages, viz.:

MILK AND BUTTER.

The chief adulterant of milk, an adulterant most plentifully found, and one having the special advantage of cheapness, is water. Formerly, the addition of flour and starch to milk was occasionally attempted, but it is not probable that such sophistication exists to-day in other than isolated cases. In the last few years, the tendency to add preservatives to milk has grown quite common. In fact, so prevalent has this practice become, that many State legislatures have made it a subject for legislative action, and in Penn-

sylvania we have a special enactment whereby it is a misdemeanor to add to milk, boracic acid salts, boracic acid, salicylic acid, salicylate of soda or any other acid, drug, compound or substance. Legislation against the addition of water is likewise general throughout the States, and special enactments, defining explicitly what shall constitute pure milk, are the rule rather than the exception. In Pennsylvania, for example, standard milk must contain 12½ per cent. of milk solids, 3 per cent. of fat, and must have a specific gravity ranging between 1.029 and 1.033 at 60° F. Under adulterated milk, there is included also milk obtained from diseased cows or from cows fed on putrid substances, the selling of such milk being made a misdemeanor and punishable.

The adulteration of butter is of so peculiar a kind and has such widespread significance, that the legislation on the subject has been undertaken not only by State legislatures, but by Congress as well. We may leave out of consideration adulteration by preservatives, such as we met under milk, since what is true of milk in this instance is likewise true of butter. Of far greater importance is the adulteration or substitution of butter, the product of milk, by the artificial product obtained from animal or vegetable fats, and known as oleomargarine, margarine, butterine, etc.

It is not within the province of this lecture to discuss either *pro* or *con*, the question of the value of oleomargarine and similar products as food-stuffs. Much has been said and even more has been written on this topic, and I believe that I am safe in saying that today even experts are undecided. Whether milk fats are more digestible than animal fats, whether the germs which may remain in oleomargarine at the low temperature at which it is produced, are more pathogenic in their nature than those which find a habitat in the cow-yard and in the stable, are not questions for us to decide. Our interest in the matter begins when there is sold, as pure butter, any oleaginous substance or any compound of the same other than that produced from unadulterated milk, or cream from the same; and here, too, our interest virtually ends. Until it is definitely proven that oleomargarine and similar products are injurious to the human organism, their sale, when sold as such, does not come under the scope of food adulteration. This fact has been taken cognizance of in our national legislation. The United States allows the sale of oleomargarine and its allies, when the seller is properly licensed and when the special laws as to branding, marking, etc., are fulfilled.

The State of Pennsylvania, however, has taken an extreme stand in the matter. By an Act of Legislature, it is a misdemeanor for any person, firm or corporate body to manufacture, sell, or offer for sale, or have in his, her or their possession, with the intent to sell the same as an article of food, any article made out of any oleaginous substance, or any compound of the same other than that produced from unadulterated milk or cream from the same, or any article designed to take the place of butter or cheese produced from pure unadulterated milk or cream from the same, or of any imitation or adulterated butter or cheese. By this law, oleomargarine and similar products, and what is known as filled cheese, viz.: cheese to which animal or vegetable fats have been added, are completely excluded from Pennsylvania.

If we examine more closely, however, we shall find that the true inwardness of this law has nothing to do with food adulteration. Below and beneath the verbiage of the enactment is the fact that the law was framed not necessarily to insure wholesome food, but to protect the large and still growing dairy industry of the State. Statistics have shown that the products of butter and cheese in the United States amounted, in 1889, to $245,000,000, or $39,000,000 more than the product of all of the gold, silver and iron mines in America. The State of Pennsylvania produces annually 100,000,000 pounds of butter, so that every individual who owns even a single cow—and of these there are many—is directly affected by the dairy question. Opposed to this is the fact that the entire oleomargarine industry is in the hands of less than twenty-five men. I believe this statement indicates with sufficient clearness that the true tenor of the law was the protection of a large number of the residents of Pennsylvania against the supposed encroachments of a few outsiders. Whether this is within the province of the State is for others to decide. It does not come within the province of this lecture.

Next in importance to the products of the dairy are those of our cereals and leguminous plants.

THE STARCHES AND VARIETIES OF FLOUR.

Fortunately for us, adulteration among these products is the exception rather than the rule, particularly in the United States. What adulteration there is consists mainly in the partial substitution of one flour or starch by another. In wheat flour, for example, in the few cases that have been reported, the adulteration consisted of damaged peas, ground rice, corn meal, and rarely the

addition of alum, to increase the whiteness. Under adulteration must also be considered musty flour and flour containing dirt and smut. Buckwheat is adulterated with wheat and other flours; sago with potato starch.

With the products of flour, such as bread, buns, cake, macaroni, vermicelli, etc., the adulteration, while more frequent, is likewise not very pronounced. Bread is said to be adulterated with alum, sulphate of copper, ammonia, flours other than wheat and inferior grade of flour. It is questionable if these adulterations are practiced to any extent in the United States. In England and on the Continent a number of cases are on record, in which the above adulterations were found and the offenders prosecuted.

Where coloring principles are a desideratum, the adulteration of bread, cake, etc., while not frequent, has been very marked. Possibly all of my hearers may remember the flagrant adulteration of buns and noodles with chrome yellow which was brought so prominently to the notice of the Philadelphia community several years ago. Dr. Henry Leffmann at that time found 8 grains of lead chromate in a pound of a sample of soup noodles, placed there to give an imitation egg color, and 2 grains of the same poison in each of the tea buns tested by him. Seventy-eight cases of lead-poisoning were reported by Dr. Stewart from eating chrome yellow pound buns, sixty-four of which were directly traced to the use of chrome yellow by two bakers, in the family of one of whom six deaths occurred, and he himself was made seriously ill. Besides this coloring, macaroni has been found to contain saffron, turmeric (which is considered injurious to health), and Martin's yellow which is poisonous. In vermicelli, pipe-clay and kaolin have been found as adulterating constituents.

In connection with the baking of bread, cakes, etc., and the presence of alum in bread, the question of alum in baking powders is of extreme importance. Alum is added to bad or slightly damaged flour by both the miller and the baker. Its action, according to Liebig, is to render insoluble the glutten, which has been made soluble by acetic or lactic acids developed in damp flour. Hence, it stops the undue conversion of starch into dextrine or sugar. It has been a popular belief for many years that the presence of alum in a baking powder acts injuriously on the human system. This belief is even held by the medical profession, and has been strengthened by the advertisements of certain baking powders which contain other substances, dwelling upon the injurious effects of alum.

In contrast to these, Dr. Blyth, the English authority on foods, states that it is a question whether in the moderate doses in which alum is taken in pastry, or bread or cake, the flour of which has been mixed with alum or alum baking powder, it has the slightest appreciable influence on health. He states that he has used it in his family for years without injury, and concludes by declaring that he is decidedly of the opinion that alum in food, in reasonable quantities, is not injurious to health. Mr. C. A. Crampton, the assistant chemist of the Department of Agriculture at Washington, who has made an exhaustive investigation of baking powders, states: "Whether the absorption of small quantities of alum into the human system would be productive of serious effects is still an open question, and one that careful physiological experiment alone can decide." Finally, Mr. Levi Wells, Dairy and Food Commissioner of Pennsylvania, in his report for 1896, which has just been published, states: "A careful study of the question leads to the conclusion that a properly compounded alum powder will perform all the desired requirements, and is no more harmful than the powders costing four or five times as much." How little weight Mr. Wells places upon the injurious properties of alum salts is shown by his recent decision on the pickle question. In this decision, Mr. Wells states that the use of "alum in pickles is not prohibited. It does not injuriously affect the same, but is added to improve the appearance and quality."

SPICES AND CONDIMENTS.

The various spices and condiments offer a very fertile field for adulteration, in that they come into the market mainly in a very finely divided form. No better example of the extent of such adulteration could be given than the bare statement of the list of adulterants that have been found in the more common spices. Nor are these isolated cases. In the samples examined, and they run into the hundreds, the adulteration is fully 75 per cent. For example, in black pepper there have been found buckwheat flour and ground hulls, cracker crumbs, Indian meal, wheat flour, charcoal, sand, bran, linseed meal, cocoanut shells, mustard husks, sawdust, ground olive stones, cayenne pepper, red clay and ship's bread. Gen. B. F. Butler has alleged that the pepper used to cure hides sent from South America to this country is washed, dried and sold as pure pepper. Mr. Wedderburn, in commenting upon this statement, aptly says: "One can imagine how he would like salt from spoiled fish or decomposed meat. This class of pepper is no better."

In cayenne pepper there have been found red lead, ground rice, flour, salt, cracker dust, Indian meal, ship biscuit, etc. Cloves contain arrowroot, along with other substances. Cinnamon is adulterated with spent bark, gypsum, rice hulls, turmeric, browned bread and crackers. Ginger contains turmeric, cayenne pepper, mustard, inferior and refuse ginger. Of all the spices and condiments, however, mustard is king, so far as adulteration is concerned. The substances reported as having been found in it include ground yellow cakes, flour, cayenne pepper, chrome yellow, Martin's yellow, gypsum, turmeric, mustard cake colored with turmeric, diluted with starch; wheat and rice flour, weighted with terra alba. Whole mustard contains clover seed, turnip seed and other vegetable seeds.

As regards spices, Philadelphia occupies a rather unenviable position. In 1890, Mr. Frank A. Hennesy reported that there existed in Philadelphia an industry of no small magnitude for the production of articles known to the trade as "spice mixtures;" that these were being made in a large steam bakery in Philadelphia, out of a grade of wheat lower than middlings. The process consisted in baking dough made from this wheat in the shape of biscuits and colored to meet the demands of the special spice it was intended to imitate. For the yellow of mustard, turmeric was used; for brown, the latter with Spanish brown; for black, charcoal. These biscuits were sold to the spice dealers, who "transformed" them into spices.

TEA, COFFEE AND COCOA.

Tea, coffee and cocoa are frequently subjected to adulteration, although since the enforcement of the United States tea adulteration law (1883), the sophistication of this commodity has considerably lessened. The forms of adulteration most commonly practiced with tea are facing, the use of spent or exhausted leaves, and the introduction of foreign leaves,. foreign astringents, such as catechu, and added mineral matter. The process called facing consists in treating the prepared leaves with mixtures of turmeric, indigo or plumbago to impart some favorite color or gloss to the leaf. Gypsum, soapstone, etc., are likewise used.

Coffee, too, is subject to facing and coloring, particularly inferior or damaged coffee, for the improvement of its appearance and in imitation of superior grades. For this purpose there have been used yellow ochre, Silesian blue, chrome yellow, burnt umber, Venetian red, drop black, charcoal, French black, glycerine, palm

oil, indigo, coal, clay, ultramarine and gypsum. More important is the substitution of coffee by the prepared root of the chicory plant, "mangold-wurzel," peas, beans and saw-dust, various kinds of seeds, cocoa husks, and in particular what is called in Germany, "Kunst Kaffee," or artificial coffee. Within the past few years, our markets have been flooded with these imitation coffees, which are composed in the main of bran, starch, flour, sugar and similar ingredients. Many of these substitutes come from abroad, but American ingenuity has likewise invented machines which enable the manufacturers of spurious coffee to turn out products so closely resembling pure coffee in appearance that its detection with the eye is difficult. Not only has ground and roasted coffee been thus imitated, but even artificial green coffee is on the market, and so close is the imitation that only experts can tell the difference. In 1891, the *Philadelphia Times* brought to the attention of its readers the extent to which this fraud was was practiced. It showed that immense quantities of what was known as "Java coffee compound" had been distributed throughout Philadelphia and New Jersey, and that the office of one of the manufacturers was within a block of the City Hall.

Cocoa is frequently and systematically adulterated, since it offers conditions so favorable for profitable adulteration. Mr. Spencer states that "there is probably no more misleading or abused term in the English language than the term 'soluble cocoa.' No cocoa on the market contains a very considerable percentage of matter soluble in water, unless the material so dissolved is foreign soluble material that has been added during the process of preparation." The most common form of cocoa adulteration is the extraction of the fat. It is claimed by some manufacturers that this is necessary in order to make the cocoa more readily digestible. Whether this is the case or not, the public should be made cognizant of the amount of fat which any special cocoa preparation contains. It is impossible within the limits of this lecture to go more fully into the details of the adulteration of these three articles. The index alone to the literature of the subject covers many pages, and each article could by itself consume the time of a lecture without exhausting the subject.

LARD AND OLIVE OIL.

Of great importance to us as food-stuffs are two articles, lard and olive oil. The character of the adulteration practised with these

two substances is somewhat limited; the extent of the adulteration seems to know no bounds. With both lard and olive oil, the usual form of falsification is the substitution of the oils and fats which occur in them, by other vegetable or animal oils and fats, in particular by cotton-seed oil. Besides this general adulterant, olive oil has a special adulterant in peanut oil, while lard contains the stearines and oleo-stearines obtained from beef and sheep fats. Finally, to cap the climax, it has been found that water to the extent of 20 per cent. may be worked in with lard, without causing any appreciable difference in its appearance, if an alkali such as carbonate of soda be added at the same time. The extent to which this last adulteration is practised is probably much larger than is generally supposed. The use of cotton-seed oil for the adulteration of both lard and olive oil has grown into a very extensive industry, and it is probable that 75 per cent. of the oil sold as olive oil, salad oil, etc., contains cotton-seed oil to a greater or less extent. Furthermore, it has been definitely proven that cotton-seed oil is shipped from this country to Europe, in bulk, there used to adulterate olive oil, and then returned to these shores labelled as a pure product of the olive.

MOLASSES, SYRUP, HONEY, CONFECTIONERY.

The adulteration of molasses and syrup has already been considered in the foregoing, where it was shown that the bulk of the samples examined contained glucose, or tin salts. These latter are added for the purpose of bleaching the molasses, and are highly objectionable on account of their poisonous properties. Sulphites and hyposulphites are likewise added for a similar purpose, and are very frequently found in the light-colored New Orleans molasses which comes into our markets. Sugar is an article of food that is rarely adulterated by added matter. Occasional samples show the presence of starch or of minute quantities of ultramarine which has been added to improve the color. Several years ago, an attempt was made to adulterate cane sugar with sugar made from corn starch, but owing to the sticky properties of the latter, the method had to be abandoned. Of low grade sugars, water is the chief adulterant. The modern methods of sugar boiling permit of the introduction of considerable quantities of water without any appreciable difference in the appearance of the sugar.

Honey, like the other food-stuffs that have been mentioned, is frequently adulterated. This is true, however, only of strained honey or of comb honey packed in glass jars, it being almost im-

possible to adulterate honey that is sold wholly in the comb. When sold as strained honey, or as comb honey in glass vessels, the adulteration practised is of the most glaring kind. The cases are frequent where the honey has been separated from the comb, the latter placed in vessels, covered with glucose, and the mixture then sold as pure comb honey. A thick syrup of cane sugar is also used to adulterate honey, but owing to the tendency which it has to crystalize, it can be used in small quantities only.

It is difficult to say what constitutes adulteration in candy, there being no fixed standard for its composition. The usual conception of candy is a compound made up of saccharine matter, flavoring, and either with or without coloring matter. So long as any of these ingredients are not injurious to health, it can hardly be said that candy is adulterated. The cheaper grades of candy contain, as a rule, commercial glucose instead of cane sugar, starch and a gum, such as gum tragacanth. Occasionally terra-alba and injurious coloring matter obtained from coal tar have been found, but, as a rule, the principal coloring consists of an organic dye which has no harmful properties. The following is a partial list of the substances found in 250 samples of candy examined by the National Department of Agriculture.

Sucrose, dextrose, maltose, dextrine, starch, gum, gelatine, grease, flour, copper, mineral colors, cochineal, eosin, corallin, Bengal red, fluorescin, ultramarine, turmeric, methyl orange, carmine, lampblack, Victoria yellow, magenta, orange red, aniline brown and Bismarck brown.

CANNED VEGETABLES, CATSUP, JELLIES, ETC.

Under one heading we may consider several groups of foodstuffs, which, while different in composition, are alike in the form of adulteration which is resorted to. These groups include the varieties of canned vegetables, fruit butters, jellies, preserves and catsups. The forms of adulterations, common to all of these, consist in the use of coloring matter, of imperfect vegetables or fruits, of other fruits and vegetables than those called for, of preservatives. In the case of canned vegetables, there is an accidental adulteration from the ingredients of the can, such as lead and tin, and which may, as a rule, be attributed to a lack of care in canning.

In all of the groups mentioned the adulteration practised is of the most flagrant and extensive kind. Catsups are made of skins and cores instead of the pure vegetables, then colored with a coal-

tar product and loaded with salicylic acid to prevent fermentation. Fruit butters are nothing but parings and scrapings of fruit, to which glucose, starch and coloring have been added, with salicylic acid as a preservative. Jellies are made from glucose, flavored with essential oils and colored, to which salicylic acid is added. Some fruit jellies marked as pure have never seen a trace of fruit. What is true of jellies is true of preserves. Put together refuse material, the cheapest sort of glucose, some coloring and salicylic acid, and you have the composition of some of the cheaper forms of preserves that are to be found on the shelves of some of our grocery stores. Of these coarser forms of adulterations it will be unnecessary to say even a word. They are universally recognized as unfit to be used, and every honest dealer is of the opinion that the sooner they are driven out of the market the better it will be for trade. Two special forms of what have been and still are considered adulterations, cannot be so lightly passed over. These are the use of copper salts for greening vegetables, such as peas, and the very extensive use of salicylic acid and allied products for the preservation of the vast bulk of the articles of food above mentioned. Regarding the greening of peas by copper salts, the last word has probably been said. At a conference between the officials of the State and a committee representing the Retail Grocers' Association of Philadelphia, held at Harrisburg, on April 15, 1896, Mr. Finley Acker, of Philadelphia, delivered an address on "Colored French Peas," in which he showed, to the satisfaction of every one present, that the addition of copper salts to peas, in the amount ordinarily used, could exert absolutely no injurious influence on the system.

Mr. Acker showed in detail that during the past forty years, hundreds of millions of cans of French vegetables had been eaten, and that in the entire time there had never been a single well-authenticated instance of poisoning that could be definitely traced to the minute quantity of copper used in preserving. He further showed that copper occurred naturally in bread, wheat, oats and other cereals, meat, wines, water, in the blood and in the organs of man, in quantities at times larger than are found in the peas under discussion. In his address he quoted as conclusive testimony, the investigations of eminent chemists, who subjected themselves and their entire families to a systematic diet of copper salts in their food for a period of years without noticing any injurious effects in the entire time.

As a result of the conference, Mr. Wells handed down his decision that all the department would require on French vegetables would be the distinct labelling "artificially colored," whenever coloring matter is used. This ruling has since been extended to include all canned vegetables, whether imported or domestic.

While, therefore, to-day there is a consensus of opinion regarding the non-injurious effect of copper salts when used in vegetables in judicious amounts, an entirely different view is held regarding the use of salicylic acid, benzoic acid, boracic acid and similar drugs as food preservatives. Notwithstanding the protests of some manufacturers that it is impossible for them to properly prepare their products without the use of such preservatives, it has always been the case that canned vegetables, etc., in good condition and free from added preservative, can be obtained if they are desired. Investigation has furthermore shown that, in many cases, the preservative has been added not to protect good food, but to improve that which is already decomposed and tainted.

There can be hardly any doubt in the mind of the discerning individual, after the conclusive and exhaustive researches that have been made, that the use of preservatives such as have been mentioned, and of salicylic acid in particular, in any quantity whatsoever, should be positively prohibited. More stress is laid upon salicylic acid than upon the others, since this is more commonly used. A single druggist in Columbus, O., reported that he had sold in one season more than 500 ounces of the drug, all of which he felt confident had been used for the preservation of food.

It is well known to-day that salicylic acid is a powerful antiseptic. As such it retards the action of organized ferments like the yeast plant and putrefactive bacteria. It hinders and prevents fermentation, the souring of milk and the putrefaction of milk. Its action upon unorganized ferments is even more powerful. It completely arrests the conversion of starch into grape sugar by disease and pancreatic extracts. This action is directly opposed to the process of digestion, and were there no other reason, the use of salicylic acid should be universally condemned. These facts in connection with salicylic acid have been recognized very thoroughly in legislation. The use of the acid has been condemned by most of the European countries having pure food laws. In France it is forbidden by law. In Austria, Italy and Spain it cannot be used without the danger of incurring a heavy penalty, and all South American States having pure food laws have absolutely forbidden its sale.

The laws of many of the States forbid its use. By a decision of Mr. Wells, the Dairy and Food Commissioner, the use of salicylic acid in foods is prohibited in Pennsylvania.

I wish to call attention here to another fact in connection with the use of salicylic acid, which is of extreme importance, viz.: the sale of preservalines, preservatives, etc., under various high sounding names, intended for use in private families. A number of these, claimed to be perfectly harmless, are on the market, but actually contain salicylic acid as the main ingredient. The conscientious and careful housekeeper should put an absolute veto upon the use of any such compound. There is rarely any need for them, since when pure fruits and vegetables are used, and the proper directions for sterilizing by heat, etc., are carried out, canned or preserved goods of all descriptions can be prepared that will remain in good condition for years without the aid of any preservative.

Of the more common food-stuffs still to be considered, are:

VINEGAR, BEER AND WINE.

All three of these are extensively adulterated. With vinegar, the main form of adulteration is the addition of water and the consequent lessening of the acidity and of the total solids which a standard vinegar contains. In Pennsylvania the standard for cider vinegar is an acidity of 4 per cent. and 2 per cent. of solids. Besides this practice, the sale of spirit vinegar, colored with caramel, for pure cider vinegar, is very common, and in fact until the enforcement of our stringent law, there was very little pure cider vinegar on the market. White wine vinegar is likewise frequently a delusion. In its place there is sold the distilled vinegar obtained from grain. This grain or spirit vinegar, even when sold for what it is, is frequently adulterated by the addition of water. The vinegar law, as at present constituted, makes no standard for any vinegar other than cider vinegar, and hence it is impossible to define what constitutes a standard spirit vinegar. This feature of the law makes the entire statute very objectionable, and it is probable that at the present session of the Legislature a new law, drafted by Deputy Commissioner Moore, of the Food Department, will be introduced to remedy this evil.

Regarding wine and beer, but little can be said at present. In this State no standards have been set up as to what shall constitute the pure article. If beer and other malt beverages should consist solely of the product of malt and hops, then the addition of burnt

sugar, licorice, treacle, quassia, coriander and caraway seed, cayenne pepper, soda, salicylic acid, salt, grains other than barley malt, is certainly adulteration.

Wine has been adulterated from the very earliest times. It is hardly necessary for me to say that the same condition of affairs exists to-day. Fortification with alcohol, the use of coloring principles, the addition of acids, and even worse forms of adulteration—such as the addition of refuse matter that will ferment—are frequently resorted to. The entire subject of liquid food and nourishment offers a very fertile field for investigation by the authorities, and must eventually end in the framing of a law which will define what shall constitute adulterations in these articles.

Before bringing this lecture to a close, I trust you will allow me a few minutes for a discussion of the Pure Food Law as it exists in Pennsylvania. Nineteen months have passed since the law was framed, and in that time it has met supporters and detractors without number. Reputable merchants, as a rule, have given it their support and have endeavored to conduct their business according to its requirements. Of all the blows which have been levelled at it, possibly the worst, so far as immediate results are concerned, is the recent decision of Judge Hemphill, of Chester County, declaring the law unconstitutional. In order to appreciate this decision more thoroughly, permit me to quote a few passages of the act of June 26, 1895, entitled "An act to provide against the adulteration of food, and providing for the enforcement thereof." Section 1 of this act reads: "Be it enacted, etc., that no person shall, within this State, manufacture for sale, offer for sale or sell any article of food which is adulterated within the meaning of this act."

Section 2 reads: "The term food, as used herein, shall include all articles used for food or drink by man, whether simple, mixed or compound—"

Section 3 reads: "An article shall be deemed to be adulterated within the meaning of this act—

"(*a*) In the case of food: (1) If any substance or substances have been mixed with it so as to lower or depreciate or injuriously affect its quality, strength or purity. (2) If any inferior or cheaper substance or substances have been substituted wholly or in part for it. (3) If any valuable or necessary constituent or ingredient has been wholly or in part abstracted from it. (4) If it is an imitation of or is sold under the name of another article. (5) If it consists wholly or in part or a diseased, decomposed, putrid, infected,

tainted or rotten animal or vegetable substance or article, whether manufactured or not, or in the case of milk, if it is the product of a diseased animal. (6) If it is colored, coated, polished or powdered, whereby damage or inferiority is concealed, or if by any means it is made to appear better or of greater value than it really is. (7) If it contains any added substance or ingredient which is poisonous or injurious to health: Provided, that the provisions of this act shall not apply to mixtures or compounds recognized as ordinary articles or ingredients of articles of food, if each and every package sold or offered for sale be distinctly labelled as mixtures or compounds and are not injurious to health."

Judge Hemphill's decision of the unconstitutionality of the law rested on Clause 2 of Section 3, which refers to the substitution wholly or in part of any inferior or cheaper substance for the food in question. The learned Judge contended that substitution was not the same as adulteration, and since there is no mention of substitution in the title of the act, the act violated the organic law of the Commonwealth, which requires the particulars of any section of an act to be nominated in the title. Unfortunately for the Pure Food Law, there is hardly any question that Judge Hemphill is correct from the legal standpoint, and the case offers but another illustration to many that have gone before of slipshod methods of legislation notwithstanding the presence of considerable legal talent in our legislature. Unquestionably, this section of the act will require revision and amendment.

Possibly other sections may require similar treatment. For example, Section 2 states that "the term food as used herein shall include all articles used for food or drink by man." * * * This section is a counterpart of the English law on the subject, and yet in England it has been decided that under this clause baking powders could not be included. Judge Hawkins, in rendering his decision, stated that "the mere sale of an article, not in itself an article of food, even though it be sold in the knowledge of the vender, that it is the buyer's intention to mix with it the ingredients of which an article of food, *e. g.*, bread, is to be composed, is no offence under Section 3, and it makes no difference, in a legal point of view, that when sold it is mixed with other ingredients not in themselves hurtful, some or one of which might in an unmixed state be used as articles or an article of food, if the injurious and harmful articles are so inseparably mixed and in such quantities as that the mixture as a whole forms an injurious compound which

no one would dream of using as a food." Referring to the baking powder in dispute, Judge Hawkins said: "Who would venture to describe such a mixture (sodium bicarbonate, 20 per cent.; alum, 40 per cent.; ground rice, 40 per cent.), as the food of man? With equal truth might not powder composed of poison mixed with flour be called food for man because pure flour is used? Possibly it may be said that the injurious ingredients, when mixed with other materials of which an article of food is composed, becomes a part and parcel of such article, but that is no argument against the vender of such injurious ingredient, unless such injurious ingredient can be treated as an article of food at the time of the sale. That is the moment when the test of its character is to be applied, and if it is not then an article of food, no offence is committed by the vender of it, though the purchaser or any one who afterwards mixes it with an article of food intended for sale, would be guilty of an offence."

This is but one illustration, but it suffices to show that astute legal minds could possibly detect other flaws in our present law. For this reason, it is well that decisions such as Judge Hemphill's should see the light of day; for, while their immediate effect is baneful, their ultimate outcome will mean the revision of the law in such a form that it will be impregnable.

Aside from the possible flaws, the law as it stands has received opposition from other sources. The manufacturer, the dealer and the retailer has each, in his turn, found some clause that was obnoxious, some section that interfered with his business interests. Without going too minutely into details, it is conceded even by those who recognize the beneficial value of a pure food law for the honest tradesman, and notwithstanding the liberal policy that has been the invariable rule of the Dairy and Food Commissioner, that it is an impossibility to comply with the letter of the law in its present form. If it were the retailer only who complained, or the dealer, or the manufacturer, or any two of these, it might be supposed that any existing fault in the law would be special in its nature. The fact that the complaint is general, leads to the inference that the fault is organic.

To my mind, the inherent error of the law lies in the absence of a thought which should always be present in legislation of this kind, the underlying idea that a distinction must be made between adulteration that is the result of fraud or negligence and that which arises notwithstanding the fact that every possible precaution to

prevent it has been exercised; in other words, the distinction between adulteration wilfully and deliberately planned, and adulteration the result of an accident beyond the power of man to prevent. Countries older in food legislation than we are have recognized this distinction, and have incorporated it in their laws and even in the punishment imposed for their infraction. In Germany, for example, where every detail of food adulteration has been worked out to a nicety, and where the punishment imposed for the violation of the statutes is severe, the law distinguishes between adulteration prejudicial to health and that which is not. In the latter case, it is first necessary to establish guilty knowledge on the part of the vender before punishment can be imposed. Where substances injurious to health are used, punishment is imposed; and should death result from the use of such substances, the imprisonment may be for a term of five years. In the case, however, where the toxic nature of the substance was known to the vender, the punishment is imprisonment for ten years, and in case of the death of the user, the seller may be imprisoned for life.

After what has been mentioned, it will hardly be profitable to discuss more thoroughly our food law or its administration. The authorities, as must be plainly seen, have no volition in the matter, but are compelled to enforce the law and to prosecute adulterations under the law, as defined in the act which regulates the duties of the Commissioner. Possibly no better proof of the inadequacy of the law could be given than the fact that, notwithstanding the exceptionally humane policy of the Commissioner, and his desire to be not only just but merciful in his decisions, the law has in several cases been a positive source of injury to unintentional offenders, who desired nothing more than to be honest and conscientious in their dealings.

But little more remains to be said. As to what shall constitute the responsibility of the State and the duty of the individual must be left for a more explicit law to decide. In general, it may be stated that the State must eventually recognize that its responsibility does not end with a mere police surveillance and the means necessary to accomplish this one function. It will finally be seen that it is within the province of the State to branch out on the broader lines of educating the community up to the standard which it imposes in its laws. That this will entail expense is without question, but this is a problem that will not admit of the consideration of cost. For the proper development of a food law

much is needed—a competent corps of officials; a thorough-working system; an efficient and suitably constructed laboratory and appurtenances for the purposes of investigation and research; the dissemination of the results of these researches, so that they reach every individual interested; all these constitute the legitimate work of the State, and should be so recognized. When this is once accomplished, and when the law is so framed that the ethical idea of a distinction between deliberate and unintentional wrongdoing is incorporated as one of its bulwarks, on that day every one will acknowledge that a pure food law has more influence in protecting the health of the community, in benefiting trade, and in inculcating the doctrines of social and moral order, which are the mainstay of the State, than has any other statute in the laws of the Commonwealth.

BEER AND TYPHOID FEVER.—The Minneapolis gastronomical publication, entitled "What to Eat," discusses the subject of beer and typhoid fever, and pretends to show by statistics that in the cities of Europe, where the use of beer is free and general, the typhoid death rate is very small. It appears from these comparisons that the average typhoid death rate for cities in the United States is nine and one-half times the average typhoid death rate for the cities of Europe.

This does not indicate that lager beer is a prophylactic in the case of typhoid fever; it simply shows that the germ theory as to the origin of typhoid fever is well founded. Beer is a sterilized beverage that is vended in kegs and in bottles, sealed against contaminating influences. Were the people of European cities to drink sterilized water distributed in gas-tight and air-tight kegs and bottles they would escape typhoid fever still more effectually than they now do, and, doubtless, some consequent upon the too free use of beer. However, there is something in the argument that the tonic effect of good beer consumed in moderation is a safeguard against the disease; because people who are "run down" physically are less able to resist disease germs than are those whose digestive powers are unimpaired.

It is said of beer drinkers that during epidemics of cholera in Europe, they suffered much less than those who used water as a beverage, because the beer is partaken directly from tap and bottle, before it can have an opportunity to become infected.

THE WATER SUPPLIES OF EIGHT CITIES IN RELATION TO TYPHOID FEVER RATES.*

By JOHN W. HILL, C. E., Cincinnati, Ohio.

I propose to occupy your time for a few minutes in the relation of some facts connected with the public water supplies of four well-known cities of Europe and four well-known cities of this country, the purpose of which is to show you that, in the matter of hygiene of our public water supplies, we are far behind our neighbors of Europe, and that, in the face of convincing evidence of the value of water of high quality, we still continue to supply our people with water unfit for drinking and other dietetic purposes.

The first city to which I shall direct your attention is Berlin. This city is now supplied with water from two stations, one at Charlottenberg, taking water from Lake Tegel, and the other and newer station at Frederickshagen, taking water from Lake Muggel. Referring to Lake Muggel, the water from this source is, in its natural condition, superior to that of many of our principal cities, and, judged by the standards of quality which have prevailed, and still prevail, in this country, would be considered in many cities as quite good enough for any or all the uses to which our public waters are applied, including drinking. That is to say, in many situations this Muggel water would be pumped from the lake to the reservoirs or to the consumers, without any attempt at improvement in its quality.

Not so, however, with our friends in Berlin. Something better than this raw water of Lake Muggel is required by their standard of hygiene, and to obtain it this already fairly excellent water is passed through an elaborate system of filters, devised by the late Mr. Henry Gill, the engineer, during his lifetime, of the company which controlled the supply of water to Berlin.

The cost of filtering water is an additional charge to the cost of pumping and distributing it to the consumers, and in Berlin amounts to $10 per 1,000,000 U. S. gallons. This includes, I am informed, the interest and sinking fund charges on the filter works.

It is sometimes said that people do not do certain things altogether "for their health," but I can assure you that the costly filtra-

*An address before the Society of Municipal Improvements, Chicago, Ills., October 9, 1896.

tion of the water from Lakes Muggel and Tegel is solely for the health of the citizens of Berlin. The average typhoid fever death rate of Berlin for the past six years was 7½ per 100,000 of population living, while for the same time the average annual rate for 28 of the principal cities of this country and one in Canada (Toronto), was 50, or our average rate was nearly seven times that of Berlin.

To state the same fact in a different form, the chances of taking and dying from typhoid fever during the past six years were seven times as great in the larger cities of this country as in Berlin.

In regard to the claim sometimes made that water is not generally used as a beverage in the cities of Germany, I have been at some pains to obtain information upon this point, and the answer is that, while the use of beer and wine is more general in Germany than in this country, at the same time, with possibly few exceptions, water is a part of the daily diet of the Germans, and, recognizing the dangers to health lurking in the sewage-polluted waters, they are very careful to drink only such water as complies with the German Imperial Standard of Hygiene.

The next city upon my list is Zurich, Switzerland, and some of the conditions surrounding the water supply of this city are not unlike the conditions found about Chicago.

Zurich takes its public water supply from Lake Zurich, a mountain source high above the usual channels and sources of sewage pollution, and one which a few years since would have been accepted as being above suspicion. Investigation, however, reveals the interesting fact that even in this body of apparently pure mountain water much organic matter and large numbers of bacteria at times have been found. Some sewage and polluted surface drainage must necessarily find their way into the lakes from the cities and towns on its borders, but the area and great depth of the lake were at one time regarded as sufficient to prevent serious contamination of the water by these means. The lake has a suface area of nearly fifty square miles, and an average depth of 230 feet, and, being hemmed in by high mountains, any disturbance by heavy gales, such as might stir up the water to great depths, is unknown.

Disastrous epidemics of typhoid fever have taught the people of Zurich that the water of the lake is not to be relied upon for drinking and dietetic purposes at all times, and now all water from the lake is carefully filtered before it passes to the consumers.

The next city on the list is The Hague. Here the water is first obtained from driven wells sunk in the sand dunes, and afterward

passed through filters of moderately fine sand. The driven well water from the sand dunes is probably comparable with much of the driven well water which, in this country, we are accustomed to accept for public supply, but the old-fashioned burghers of The Hague seem to think that better water than this is required for drinking and some other uses, and go to considerable expense to secure it by slow filtration through beds of fine sand.

It is interesting to note that of all the larger cities of the world, The Hague has had, for the past six years, with the exception of 1891, the lowest typhoid fever death rate. The average typhoid fever death rate for The Hague, per 100,000 population living, including 1891, for six years past, was lower than 5, and, excluding the rate for 1891, the average for the other five years was 3.8, or slightly more than half the rate previously mentioned for Berlin.

Comparing this rate with the average rate for the large cities of this country for the same period of time, it appears that our death rate from typhoid fever was from ten to thirteen times that of The Hague.

At this point I wish to ask the members of the Convention if they do not believe that our typhoid fever rates should be as low as those of the cities of Europe? Do you not think that the same methods which are known to have reduced the typhoid rates of the cities of Europe, if applied here, will have the same effect? Do you agree with me that the time has arrived to stop supplying our helpless citizens with water which is carrying the germs of disease into many families, and that it is our duty to see that the present condition shall exist only for such length of time as may be necessary to apply the proper remedies?

The last city in Europe to which I wish to refer is Liverpool. This city now obtains its water from a large artificial lake in the valley of Vyrnwy River, in North Wales, distant about 65 miles from the city. The watershed from which Lake Vyrnwy is supplied is in the wildest part of the country, the nearest railway station, as I am informed by my friend, Mr. Rafter (who has visited the works), is twelve miles distant, and, altogether, the catchment area is one that would recommend it as being free from obvious sewage pollution.

The water impounded in Lake Vyrnwy should equal the impounded water of many of our large cities, but every gallon of water from the lake is first filtered before it flows into the mains of Liverpool.

With the exception of mountain springs, such as supply Vienna and Munich, or carefully planned works for ground water, such as supply Dresden, or deep well water, such as supplies the Kent district of London, the foreign engineers generally seem to regard all other of the usual sources of water supply as open to suspicion.

The City of New York, as is well known, obtains its public water supply from a number of large impounding reservoirs (including Croton Lake), constructed in the valley of the Croton and Bronx Rivers. The watershed from which the run-off of rainfall is gathered in these reservoirs, is not free from human habitations, and in spite of all precautions taken by the city, some sewage pollution of the Croton water is liable to occur. The water of New York ranks high in quality when compared with the public supplies of many other American cities, but it fails to attain the high standard of excellence reached by several cities abroad.

Excepting mountain springs and deep wells in the rock and drift, it is probable that the Croton water is equal in quality to that from any natural sources, but it is still inferior to the filtered water of London, taken from the River Thames, to the filtered water of Berlin, from Lakes Tegel and Muggel, to the filtered water of Hamburg, from the River Elbe, and to the filtered water of Rotterdam, from the River Maas.

The typhoid fever death rates per 100,000 of population living in New York, London, Berlin, Hamburg and Rotterdam are given in the following table:

	1890.	1891.	1892.	1893.	1894.	1895.	Average.
New York	21	22	22	20	17	17	20
London	16	15	11	16	15	14	14½
Berlin	9	10	8	9	4	5	7½
Hamburg	28	23	34	(18)*	6	9	7½
Rotterdam	6	4	6	5	4 5/10	2	4 6/10

The filters at Hamburg were started in service during the year 1893, for which a part of the supply came direct from the River Elbe to the consumers, and during the latter portion of the year the water was filtered before it went to the consumers.

Now, mark the effect of the filtration of the sewage-polluted Elbe water, under the able supervision of my friend, Dr. Dunbar. For the three years prior to filtration of the Elbe water, the average number of deaths from typhoid fever per 100,000 of population for each year were 28, and when the water supply was filtered, for the years 1894 and 1895, the average deaths from typhoid fever, 7½ per

*Filters started, May, 1893.

100,000 of population, or the reduction in the typhoid rates amounts to nearly 73 per cent. Is this not a record of which any city may be proud?

Recent information from Hamburg leads me to expect a lower typhoid fever rate for this year (1896) than the city had for 1894.

The City of Chicago takes its water supply from Lake Michigan, into which, according to President Eckhart, of the Drainage Commission, is now being discharged the sewage from 1,567,500 people, and in addition to the sewage of the city proper, the lake is continually receiving large quantities of refuse and filth from the water-craft entering and leaving the port. With favoring winds, it is claimed that sewage from the eastern shore sometimes crosses the lake to the intake cribs of the city water-works. No attempt is made at purification of the water before it is supplied to the consumers.

In a lecture which I had the honor to deliver before the faculty and students of the University of Illinois last winter, I made the following statement, with reference to the public water supply of Chicago:

"The cities of Berlin and Chicago are nearly alike in population, but they are very unlike in their typhoid fever death rates, as is shown by the following table for the past five years:

	1890.	1891.	1892.	1893.	1894.	Average.
Berlin	9	10	8	9	4	8
Chicago	83	160	104	42	31	84

That is, the average death rate from typhoid in Chicago for the five years mentioned was nearly 10½ times that of Berlin.

"The drainage areas from which the City of Berlin obtains its water supply are protected from sewage pollution, and the water from Lakes Tegel and Muggel is very carefully filtered until it complies with the requirements of the Imperial Board of Health before it is delivered to the consumers. Until Chicago devises works which will render its public water equal in quality to that of Berlin, it cannot hope to have the low typhoid fever rates which prevail in the German capital.

"Apart from the difference in the quality of the waters, there seems to be no reason why the City of Chicago should have a higher typhoid fever rate than Berlin. Both are business and social centres, with large floating populations, and more exposed than smaller or less populous cities to the influence of imported infection; yet, in spite of this, Berlin, by reason of the care exercised

in maintaining the quality of her public water supply, has nearly the lowest typhoid rate of any of the capitals of Europe."

From information furnished me by the Commissioner of Health (Mr. Wm. R. Kerr), the water supply of the city previous to January 1, 1893, was taken from the two-mile intake cribs, and from points in the lake less than two miles from shore. The average typhoid fever rate for the years 1890-91-92 was 116 per 100,000 of population, while for the three years, 1893-95 inclusive, the rate was 35 per 100,000 of population, the lower rate being ascribed to the extension of the tunnel intakes to the four-mile crib. The typhoid fever death rate for 1895 was 32 per 100,000 of population, and from recent reports received from the Health Department of this city, the rate will be quite 60 per cent. higher for the present year than for 1895, or will approach 51 deaths per 100,000 of population.

The city is about to take steps in the direction of an improved quality of public water, and the best evidence of necessity for this can be had from the typhoid statistics for the past few years.

The rates prior to the opening of the four-mile tunnel were awful to contemplate, and the rates since the opening of the four-mile tunnel are altogether too high for a city of the population, wealth and enterprise of Chicago.

The last cities to which I wish to draw your attention are Philadelphia and Cincinnati. The conditions surrounding the sources of water suply for these cities are quite the same. Each city takes its water from a river, which is the channel of sewage discharge above the point of intake, and, as one might naturally suppose from knowledge of the facts, the typhoid fever death rates of these cities are not only high when compared with cities which are enjoying superior water supplies, but are nearly alike. The death rate per 100,000 of population for the six years ending December 31, 1895, for Cincinnati, was 49.7, and for Philadelphia, 46.8.

In neither Philadelphia nor Cincinnati is any attempt made to improve the quality of the water before it is delivered to the consumers, but the plans proposed by the Engineer Commission for the latter city contemplates the pumping of the water from the Ohio River to large subsiding reservoirs, from which, after a reasonable time has been allowed for precipitation of the heavier suspended matter, the water will be drawn to filters, which were designed upon the same general lines as the filters of Hamburg.

The officials and citizens of Philadelphia seem to fully realize the necessity of radical measures for improvement in quality of their public water, but no decisive steps have been taken there to reach this end.*

In my lecture, previously mentioned, at the State University, I took occasion to show the money value of the annual typhoid fever loss, which for the whole country was estimated at $527,750,000, an amount (capitalized at four per cent. for fifty years), which represents over eleven times our national debt.

It will be interesting at this time to estimate from a financial standpoint the losses to Chicago from typhoid fever since 1890, not including the present year.

The total number of deaths from typhoid fever for the six years, ending December 31, 1895, were 6,174, and the cases that recovered estimated at five times the deaths, 30,870. The value of a human life, under the laws of Illinois, I believe, is $5,000.

The value of lives lost will be	$30,870,000
Burial expenses	370,440
Medical attendance, all cases	1,481,760
Loss of time by those who recovered, estimated at $1.50 per day for six weeks	1,666,980
Total	$34,289,180

representing an average annual loss of $5,731,530, a sum which, if capitalized at four per cent. for fifty years, will represent an investment of $123,125,186.

This is upon the assumption that all cases of typhoid fever are preventable. While I believe this is possible, the prophylactic measures necessary to remove typhoid fever from the list of diseases altogether seem to be too costly for the present generation.

It will be more reasonable to assume the possibility of reducing by practical methods the death rate from typhoid in Chicago to 10 per 100,000 of population, and this based on the estimated death rate for the present year, will represent a saving of at least 40 lives per 100,000 of population. Taking the population in round numbers at 1,600,000 this will represent a saving of

640	lives valued,	at $5,000 each	$3,200,000
640	burial expenses,	at 60 each	38,400
3,840	medical expenses,	at 40 each	153,600
3,200	losses of time,	at 54 each	172,800
		Total	$3,564,800

*Since the above was written, I am informed by Mr. John C. Trautwine, C. E., that two ordinances for improvement of the Philadelphia water supply are now under consideration by councils.

a sum which, if capitalized at four per cent. for fifty years, represents an investment of $76,579,319.

You will observe that the rate of 10 per 100,000 of population of the annual mortality from typhoid fever is considerably in excess of the average annual losses, for the past six years, for the cities of Berlin, Rotterdam and The Hague, and one-third greater than the typhoid mortality rate for Hamburg since the Elbe water has been filtered.

In connection with sources of water supply, like our great lakes, and large impounding reservoirs, such as constitute the sources of supply for New York, Boston, San Francisco and other cities, it is well to remark that seasonable changes in temperature in the several strata of water, combined with winds, produce considerable variation in the quality of water at different seasons of the year, for the same depth, and it is not possible, as some suppose, to select a depth of intake in such lakes which will, at all times, furnish the best water from such sources.

Under certain conditions of air temperature the best water may be found near the bottom of the lake, and under different conditions of temperature the best water may be found near the surface. This subject is very ably presented and discussed in a paper by Mr. Desmond Fitzgerald, in Transactions of the American Society of Civil Engineers for August, 1895.

The substance of Mr. Fitzgerald's paper is that twice each year there is a more or less complete rotation of the body of water in large lakes and impounding reservoirs, the cooler water at the surface passing downward to the bottom, while the warmer layers of water at the bottom, or at considerable depths from the surface, pass upward to or near the top.

These overturnings and readjustments of the layers of water, according to temperature, will be accelerated and augmented if taking place during seasons of high winds, which frequently is the case.

With this rotation of the water strata occur marked changes in the quality of the water at different depths of the lake, causing organic matter which has lain stagnant for months on the bottom of the lake or reservoir, to be brought to the surface, to undergo, in due time, precipitation again to the bottom.

Under this condition, which the investigations of M. de Saussure and others abroad have shown, and which Mr. Fitzgerald and others in the Eastern States have amply confirmed, it is apparent that

the best water in the lakes of more than twenty-five feet in depth cannot, throughout the year, be obtained from any fixed depth, and that the depth at which the water should be taken should vary with the seasons, to avoid as much as possible the influence of these seasonal overturnings and disturbances of the layers of water from the surface of the lake downward.

It has been the custom heretofore to fix the depth of intake near the bottom of such lakes, and where the water is pumped from the lake to filters, as at Zurich, Switzerland, it is immaterial where this depth is taken, provided the intake is not so near the top as to take in water subject to the direct influence of the sun's rays in summer, nor so near the bottom as to stir up the precipitated organic matter by the currents of inflow to the pumps; but in cases where filtration is absent, the depths should be variable and adapted to take the best water surrounding the point of intake.

In conclusion, I wish to call attention to an error which often finds its way into papers and discussions on the cause of typhoid fever. Many writers, including some learned physicians, are prone to the theory that typhoid fever can be traced to sewer gases, holding them as causes, when they are not and cannot, in the light of present knowledge, be considered as causes.

Sewer gases and atmospheres containing the gases from putrefying organic matter are deficient in oxygen, and may be regarded as having a strong influence on the susceptibility of persons to typhoid fever, but are entirely distinct from and independent of the cause of this disease.

Thus with a perfect system of sewerage, drainage and ventilation, but with a sewage-polluted water supply, typhoid fever will still exist, although with rates reduced in some proportion to the improvement of the quality of atmosphere inspired.

But with a perfect water supply and bad drainage, sewerage and ventilation, while the vitality of persons exposed will be lowered, there will be no danger from typhoid infection, since the cause of typhoid cannot exist in a pure water.

In this case I do not consider the possibility of infection by other articles of diet than water, because it has been shown in the reports of the Massachusetts State Board of Health that quite 99 per cent. of all typhoid is traceable to polluted or typhoid tainted water supplies (Sedgwick).

Therefore, typhoid infection from other causes or carriers than water may be regarded as in the nature of accidents, to which we are all exposed, and from which few suffer.

MEDICAL EXCERPT.

By T. P. Corbally, A. M., M. D.

Acute Oedema of the Lungs.—M. Huchard, *Gazette Hebdomadaire*, 2d May, 1897, has presented a most interesting communication to the Académie de Médecine, on "Acute Oedema of the Lungs;" he attributes this oedema, which is sometimes alarming, to inflammation of the aorta or to a peri-aortisis with an inflammatory or reflex action on the cardio-pulmonary branch of the nervous plexus; this occurs usually in arterio-sclerotitis.

While this oedema takes place most frequently in sclerotic conditions of the aorta, it is often preceded by a very great diminution of the aortic tension, and by a rapid and enormous increase in the pulmonary tension. The right ventricle resists this, and becomes hypertrophied; and, so long as it is able to resist, the oedematous condition of the lung is prevented; but if the power to resist gives way suddenly, for any cause, the acute oedma speedily takes place. The defect then is not in a defect of the left, but in that of the right. The pathogenic relation, then, is this, disturbance of the cardio-pulmonary innervation by the peri-aortisis; great increase of the vascular tension in the lesser circulation; acute or rapid insufficiency of the right ventricle.

The therapeutic indications that follow from this pathogenic theory may be summed as follows:

The heart is strengthened by diminishing its work; in order to meet this indication a copious bleeding, equal to 300 or 400 grams is directed, besides local extraction of blood by wet cups over the thoracic cavity and over the liver and by a repeated application of dry cups over the thorax, the trunk and the limbs.

A tendency to collapse of the heart is met with injections of caffeine and camphorated oil.

To ward off disturbance of the cardiac-pulmonary innervation, and especially paresis of the bronchial tubes and of the diaphragm, recourse must be had to the preparations of strychnine, especially in the form of injection; the return of similar attacks must be met by cauterization over the sternal region or by the application of cauterization or of wet cups in the same locality.

In regard to morphine or atropine, so much praised by some authors in similar conditions, they are admissible when they do not

interfere with the action of the urinary organs. The same rule will apply to blisters and to the use of iodide of potassium; this latter remedy being of itself capable of causing an acute or a subacute attack of the oedema of the lungs.

Finally it is necessary to keep up a very free action of the urinary organs. This may be accomplished by exclusive use of a milk diet and of theobromine, to the extent of 1½ grams to (3) three grams a day.

The rhenal changes observed in such patients are due to the disturbed condition of the aorta.

RICKETS IN PARIS.—Dr. Beluge made the following statement to the Congrés des Sociétés Savantes, *Progres Medicals*, 1st May: Rickets are very common among the working classes. Of the cases observed 33.75 per cent. occur under 3 years. 2d. Children fed on the breast, 28.59 per cent.; on the bottle, 45.36 per cent. 3d. Rickets are comparatively rare during the first six months, only 6.59 per cent.; from six months to a year, 33.33 per cent.; from one year to 18 months, 58.28 per cent. 4th. The time at which it appears generally is when the child is weaned, and it becomes necessary therefore to carefully observe this period of infantile life, both as to the nourishment as to the attempts to walk and to general hygiene.

FIRST SOUND OF THE HEART.—The *Gazette Médicale*, gives the remarks of M. Mongour on four new cases of the disappearance of the first sound of the heart in typhoid fever, a phenomenon which was first observed by Picot, and by Stakes.

The subject was discussed in a memoir to the Congré de Médecine in 1895. He now gives the following, in the *Presse Medicale*, of the 2d of April.

1st. The disappearance of the first sound of the heart, whether at the apex, at the base, or in both situations at the same time, generally comes on during the period of oscillation in typhoid fever.

2d. The systolic sound reappears during the last oscillations, before the beginning of the hypothermic period.

3. When observed as an isolated cardiac symptom, the disappearance of the systolic sound is not accompanied with grave functional disturbance.

4th. This symptom may occur during the period of a relapse, having been observed in the first period also.

5th. The prognosis regarding this complication, is intimately associated with the frequency of the pulsations; below 110, it is without danger; if it reaches 120, there is great danger; above 120, death may be looked upon as certain. The dicratic action of the pulse does not form a specially grave element in the course of the disease.

6th. While keeping in view the transitory nature of this symptom, and of the fact that the first sound reappears with its rythm and normal intensity, it may be asked if this disappearance of the systolic sound is not intimately associated with a disturbance of the nervous system rather than with a lesion of the cardiac fiber?

MICROBES OF THE GLANDS OF THE EAR.—In a report to the Société de Médecine de Berlin, a microbe of the ear has been described. It has been found in Steno's duct, in patients in the service of Leyden.

It is a sort of diplococus forming links which have a slight movement. Found in the cells, it resembles the gonococus or the menongococus, but it is much less in size. Cultures formed with it resemble those of the streptococus.

SUBNITRATE OF BISMUTH—POISONOUS?—A communication of M. A. Dubreuilh, was presented to the Société de Therapeutique, *Gazette Hebdomadaire*, 25th April, as follows: A man, thirty years of age, took a dose of 3 grams of subnitrate of bismuth to check a diarrhoea from which he had suffered for several days previous, and was covered with an intense eruption, resembling scarlatina. This erythema lasted four or five days, and ended in a desquamation in scales, most abundant on the feet and hands.

The patient was attacked for the third time with the same erythema, and always after the use of the subnitrate of bismuth; he had several other attacks of diarrhoea without any symptoms of erythema or other form of skin trouble. This is a fact that it is necessary to emphasize, since the frequent occurrence of infectious desquamative erythema is well known to take place in cases of disease, as for instance in entero-colitis.

The clinical and experimental proofs of the toxic effects of the subnitrate of bismuth, when employed externally, has been known for several years, but the author says this is, in his experience, the only instance of its poisonous effects when given internally.

HAEMOKONIA.—Dr. Muller of Vienna has described certain particles found in the blood under the name of haemokonia (blood-dust). They resemble fat-globules, and the largest are 1-25000 of an inch in diameter. They are motile and are unaffected by osmic acid.

EDITOR'S TABLE.

SANITARIAN, JUNE NUMBER, 1897.

☞ ALL correspondence and exchanges and all publications for review should be addressed to the Editor, DR. A. N. BELL, Brooklyn, N. Y.

THE CENTENNIAL CITY.

The managers of the great industrial exposition which illustrates the Tennessee Centennial were compelled to have the limits within which it will be held incorporated with all the powers incidental to municipalities, since otherwise there would have been no police protection. Consequently, all sanitary matters within the said bounds will be under the jurisdiction of the said authorities. It is understood that in all respects the sanitation will be a model. Neither expense nor care will be spared to gain this end.—Bulletin Tennessee State Board of Health, April 20, 1897.

NASHVILLE, Tenn., May 11, 1897.

Editor SANITARIAN:

Permit me to call your attention to an article in your May number, quoted from a recent issue of the *Memphis Commercial Appeal*, which is unjust and misleading. We are willing to stand on facts, and with facts comparisons can be made; and I would ask that you kindly publish the statistics, from the State Board of Health Bulletin of December, 1896, taken from the official reports of the respective Health Officers of Memphis and Nashville.

Memphis, with a white population of 28,561; colored, 27,573, total 56,134, reports total number of deaths for the year 1896, 1,348—whites, 625; colored, 723. Annual death rate for whites, 21.88; colored, 26.22; total, 24.01.

Nashville, white population, 54,595; colored, 33,159, total 87,754, reports total number of deaths for the same period, 1,809—whites, 838; colored, 916. Annual death rate for whites, 16.35; colored, 27.62; total, 20.61.

Under the heading of "Constitutional Diseases," the *Memphis Commercial Appeal* places particular stress on Nashville's loss by consumption. Memphis lost last year, from constitutional diseases, 432, while Nashville, with more than one-third larger popu-

lation, lost from the same causes, 416. There seems to be something wrong with our Bluff City editor. While Memphis is generally conceded to be a great summer resort for health and pleasure seekers, Nashville has never taken much stock in that Wolf River joke; nor do we believe that the *Memphis Commercial Appeal* has taken to its health-preserving qualities. They were raised principally in the moonshine regions of Tennessee and know a good thing by more ways than the smell, and would scorn to accept any substitute carrying no stronger "bead" than Wolf River. Nashville does not question the odor.

Our gates are crowded with Centennial visitors, and all are loud in their praise of Nashville's clean appearance and healthful condition. And if Memphis does appear on the map as a way station, we can't help it. ROCK CITY.

BROOKLYN DAY AT NASHVILLE.

The Mayor's Nashville Celebration Committee has wisely selected October 11 as the day for the visit of the representatives of Brooklyn to the fair. This is at a season when a trip into the South will not be so uncomfortabek as it would be in the middle of the summer. It is warm enough here in June, but it would be still warmer several hundred miles closer to the equator. October is a pleasant month everywhere. Travel through the country then will be delightful, and a night in a sleeping car will not be intolerable. Nashville is worth visiting for itself alone, and with the fair in progress its attractiveness will be greatly increased. Even if the excursionists were not assured of a pleasant trip it would be worth their while to go to the Southern city simply for the purpose of strengthening the bond which now binds the North and South together. Greater knowledge of Southern conditions will be followed by greater sympathy with the Southern desires and ambitions.

The women members of the Commission were appointed the Committee on Exhibits. The names and addresses of officers thus far selected are: President of the Commission, Herbert F. Gunnison, Eagle Office (Tel. Brooklyn 1351), Residence, 209 Hewes Street (Tel. Williamsburg 151). Secretary of Commission, William C. Redfield, 9 Richards Street (Tel. Hamilton 56), Residence, 3 Tennis Court (Tel. Flatbush 98). Chairman Executive Committee, William Berri, 524 Fulton Street (Tel. Brooklyn 35), or N. Y. and Brooklyn Bridge, 179 Washington Street (Tel. Brooklyn 346), Residence, 401 Grand Avenue (Tel. Bedford

220). Chairman Committee on Exhibits, Mrs. Cornelia H. Cary, 33 Pierrepont Street. Secretary Committee on Exhibits, Miss Ellen A. Ford, 350 Clermont Avenue.

"THE SMEAD SYSTEM" of contaminating the air of school houses as a condition of warming it, continues to keep itself before the public, despite the fact that school-house sanitation requires the practical application of both physical and physiological knowledge, with which "The Smead System" is in conflict. It is no discredit to members of boards of education generally that, in the exercise of the functions expected of them, they are not supposed to be physicists, physiologists or sanitarians. But when they lend themselves to the promotion of schemes in conflict with the healthfulness of schoolhouses and assume precedence of the health authorities whose business it is to have and to exercise such knowledge, then such officials become dangerous to the health of school children and ought to be abated. For example: Niagara Falls (Gazette), May 13.—The Board of Education held a meeting last night to receive and act upon a communication from the Board of Health, which formally condemned the plan proposed of putting the Smead heating and ventilating system into the new schools now being built, on the grounds that the system was not sanitary nor desirable from a health standpoint. The Board of Education refuses to receive this determination of the Board of Health as final, and will appeal to the State Board of Health to see if the sys- that is wanted so much by them cannot be placed in position without local interference.

NEW WAY OF RIPENING FRUITS.—"The next time you buy any fruit from a street peddler," said Dr. Constantine of the Health Department this morning, "it might be well to remember that it was probably ripened in some filthy tenement-house bed. It is a common practice for Italian fruit venders," he continued, "to hasten the ripening of bananas, oranges and lemons by placing them in their beds, where the fruit receives the animal heat from their bodies. Fruit subjected to this process will ripen in an incredibly short time."—Buffalo News, May 13.

MORTALITY AND MORBILITY REPORTS AND REVIEWS.

Correspondents under this head are particularly requested to be as prompt as possible.

THE MARINE HOSPITAL SERVICE.

Annual Report of the Supervising Surgeon-General of the United States Marine Hospital Service for the Fiscal Year 1896.

A volume of 1,079 pages, with numerous photo-engravings, diagrams, maps and tables, describing in detail the comprehensive scope of the service and its effect under recent laws both in coöperation with and independent of state and local boards of health, to prevent the introduction and spread of epidemic diseases, besides its fundamental purpose, the sanitary supervision and medical care of American seamen. A tabulated statement of the number of sick and disabled seamen furnished relief since the reorganization of the service, in 1871, to 1896 inclusive, shows a continuous and almost annual increase, from 14,256 in 1871 to 53,804 in 1896.

For the year under review, there were in hospital July 1, 1895, 886; addmitted during the year, 12,068; total treated in hospital, 12,954; discharged, 11,780; died, 430; remaining in hospital June 30, 1896, 744; number of days relief in hospital, 365,461; number furnished office relief, 40,850; number of times relief was furnished, 63,123; number of persons examined physically, including pilots, 2,626. Amount of money expended, $559,476.24; tonnage tax collected, $546,342.55. About one hundred pages are taken up with reports of cases of special interest to practitioners.

The Public Health Service, in its various details, occupies about two-thirds of the volume. It begins with a historical sketch of the prevalence of cholera for the year, and of the conditions, local and commercial, by which it was promoted. Yellow fever is sketched in like manner, with a tabulated statement of its extensive prevalence in Cuba.

Official Reports of the Spanish Army Sanitary Corps show that during the twenty days ending July 20, there were admitted to the military hospitals 1,835 cases of yellow fever, and during the same period 497 deaths from it. November 1 to October 8, 1895, the Sanitary Inspector, Burgess, at Havana, reported 2,171 cases and 788 deaths from it in that city. During the same period there were reported in Matanzas, Santiago and Sagua la Grande more than as many more. The local conditions of Havana promotive of the disease are described in considerable detail.

Small-pox in the United States during the year is next described, in twenty-two states, covering seventy-four county and munici-

pal districts, for the suppression of which the service rendered aid in several places and in various ways.

Plague is also briefly reported upon in Hongkong, where, from January 5, the date of the outbreak, to March 16, 1896, there were 234 cases, with 204 deaths reported. Quarantine plants and sanitary supervision at seaports generally, at home and abroad, show marked improvement during recent years. Some of them—as all should at infected ports—comprehending the sanitary supervision of vessels, their personnel, food and water, baggage and merchandise about to embark, no less carefully than to those from infected ports on arrival.

Considering the abominable local conditions of Havana and the consequent liability of almost everything there to become infected, it is beyond question that the sanitary inspection exercised there, under direction of the Marine Hospital Service, is the chief means of preventing the transportation of yellow fever hither. The practice should be made universal; it is but an elaboration of preventive measures by intelligent sanitary officers in all civilized communities.

It is gratifying to observe in this regard an increasing cordiality of the relations between the Marine Hospital Service and the State and local health authorities, in the common purpose of preventing the introduction and spread of epidemic diseases—a cordiality and coöperation which should be fostered by all who would be no longer purblind to the changed conditions of the Marine Hospital Service under its present auspices.

The Hygienic Laboratory is an important arm of the service, under the supervision of Surgeon J. J. Kinyoun. The leading topic of his report is the production, cultivation and preservation of diphtheria anti-toxin—a thoroughly practical report—of interest to all who would be conversant with the means of obtaining the best results from anti-toxin treatment. The elaborately tabulated results of bacteriologic analyses of wells, springs and Potomac water of the District of Columbia, are well calculated to stimulate the purpose of securing a wholesome water supply for the District and its thousands of visitors.

ALABAMA.—W. H. Sanders, M. D., State Health Officer, Montgomery.

Mobile, 37,817. J. A. Abrams, M.D., Health Officer, reports March: Deaths, 56—8 under five years of age. From consumption, 10; annual death rate, 17.56.

Selma, 7,622. J. A. McKinnon, M. D., Registrar, reports for the year 1896: Deaths, 174; death rates per 1,000, white, 20; colored, 25.23: 22.82.

CALIFORNIA.—W. F. Wiard, M. D., President, Sacramento; J. R. Lane, M. D., Secretary, Sacramento. The Secretary reports for March: Returns from 46 cities, towns, villages and sanitary districts, aggregating a population of 747,555, show a mortality of 1,077—a death rate of 1.44 per 1,000, or an annual death rate of 17.28. 94 were from consumption, 99 from pneumonia, 22 from bronchitis, 13 from congestion of the lungs, 25 from diphtheria (and croup), 5 from measles, 12 from typhoid fever, 2 from malarial fevers, 5 from cerebro-spinal fevers, 43 from cancer, 1 from erysipelas, 46 from diseases of the heart, 6 from alcoholism, 14 from grippe.

Reports of prevailing diseases from 25 localities outside of the larger cities and towns give 22 cases of pneumonia, 120 of bronchitis, 16 of pleurisy, 14 of congestion of the lungs, 14 of diphtheria, 669 of measles, 84 of whooping cough, 186 of grippe, 17 of typhoid fever, 40 of malarial fevers. Measles epidemic at Fresno, Vallejo, Truckee, Selma and San Rafael; whooping cough epidemic at Fresno, Watsonville, and Vallejo, and chickenpox at San Rafael.

Governor Budd recently appointed the following gentlemen members of the State Board of Health for four years: Dr. C. A. Ruggles, of Stockton, and Dr. C. W. Nutting, of Etna Springs, succeed themselves. The new members are Dr. R. W. Hill, of San Pedro; Dr. D. D. Crowley, of Oakland; Dr. J. F. Morse, of San Francisco; Dr. A. M. Henderson, of Sacramento; and Dr. W. P. Matthews, of Sacramento, Secretary. Dr. J. F. Morse is now, by this appointment, a member of the State Board of Health, and of the Board of Health of San Francisco City and County.

San Francisco, 360,000. Reports for March: Deaths, 560—124 under five years of age. From consumption, 83; acute pulmonary diseases, 66; from zymotic diseases, 39; diphtheria (and croup), 19; typhoid fever, 7. Annual death rate, 18.60. Contagious diseases reported during the month: Diphtheria, 30; scarlatina, 14; measles, 263.

Los Angeles, 100,000. Reports for March: Deaths, 143. From phthisis, 46; "tuberculosis," 10; acute pulmonary diseases, 91. Annual death rate, 17.16. "N. B.—Of the 46 deaths from pulmonary consumption, as follows: Natives of Los Angeles, 2; na-

tives of the Pacific Coast outside of Los Angeles, 4; from other parts, 40; (of the 46 deaths 33 had lived here less than ten years)."

COLORADO.—Denver, 160,000. William P. Munn, M. D., Health Commissioner, reports for March: Deaths, 84. Of these 50 were caused by consumption, 31 contracted elsewhere; 26 by acute pulmonary diseases; 4 by diphtheria; 5 by measles; 3 by whooping cough; 4 by typhoid fever, and the rest from scattering causes. Annual death rate, 13.80 (excluding phthisis contracted elsewhere), 11.41.

Colorado Springs. *The Evening Telegram*, of May 8, referring to THE SANITARIAN'S report of the unsanitary condition of the city, deems it—

"Extremely unfortunate that the series of articles published in a morning paper some weeks ago in the interests of a certain 'sterilized milk' establishment south of the city, should have been taken seriously by the medical journals throughout the country and used to the prejudice of this city as a health resort."

And proceeds to declare that Colorado Springs has the purest water supply of any city of the same size in the world, and that the milk supply had nothing whatever to do with the prevalence of typhoid fever in the city, which it endeavors to account for "because of the general prevalency of typhoid all over this region, and because of the absence of any specific cause, the trouble must be attributed to a peculiar and general climatic condition prevailing in the months of greatest sickness, viz., July, August and September." But, it adds:

"The Board of Health has recently adopted and put into operation such strict sanitary regulations that Colorado Springs will in time come to be known as the model city of the entire country as respects sanitation and hygiene."

In virtue of this, Dr. B. B. Grover, City Physician, sends us a newspaper statement that he has completed his April report. According to this report the sanitary condition of the city is very good, and the death rate is remarkably low for a city which has so many invalids in it. During the month of April only 17 deaths are reported, which makes the death rate 10.2 per 1,000. And if the cases of consumption which are contracted elsewhere are stricken from the mortality list the death rate would be reduced to 4.2 per 1,000.

In the "Health" Ordinance of the city, recently adopted, as an offset to the abominable conditions which gave rise to the epi-

demic of typhoid fever, is the following extract, evidently from the quarantine regulations of Venice in the fourteenth century—substituting other names for the plague—when the people generally believed, as *The Evening Telegram* now believes, that such diseases are due to "peculiar general climatic conditions," and adopted, in lieu of local saitation, such restrictions as this:

Section 10. Quarantine shall be established and maintained in each and every case for the period named herein, to wit:

Asiatic cholera, twenty-one days.

Smallpox, forty days.

Scarlet fever, thirty-five days.

Diphtheria, thirty-five days.

Membranous croup, thirty-five days.

CONNECTICUT. — Professor William H. Brewer, Ph.D., New Haven, President; Professor C. S. Lindsley, M. D., Secretary, New Haven. The Secretary's bulletin for March comprises reports from 164 towns in the State, with an aggregate population of 850,610, from which the number of deaths reported for the month was 1,369—287 under five years of age. The death rate for the larger towns is 19.50; for the smaller, 18.17, and for the whole State, 19.3. Deaths from zymotic diseases, 126—9.2 per cent. of the total mortality.

Cases of infectious diseases reported: Measles, 122; scarlatina, 188; diphtheria and croup, 160; whooping cough, 55; typhoid fever, 17.

DISTRICT OF COLUMBIA, 275,000—87,900 colored.—Wm. C. woodward, M. D., Health Officer.

The Health Officer reports for the year ending June 30, 1896: Deaths, 3,302 white, 2,610 colored: 5,904. Death rates, white 17.61; colored, 29.48: 21.43. Causes of death classified—Zymotic diseases, 1,247; constitutional, 1,201; local, 2,691; developmental, 531; violence, 234. Of the deaths from zymotic diseases: Measles, 70; diphtheria, 75; typhoid fever, 228; malarial fever, 84; grippe, 53; diarrhoeal diseases, 468; scarlet fever, 13. Deaths from pulmonary consumption, 705—11.91 per cent. of the total mortality; there were from tuberculer diseases, besides consumption, 272. Of the total mortality, 2,094 deaths were of children under five years of age. Births reported, exclusive of 520 still births, 4,706. Of the 520 still births, 339 were colored. Marriage returns, 2,237—749 colored. Milk inspection, garbage and

other refuse disposal, disinfecting plant, and isolation hospital are reported on with considerable detail, with illustrations.

FLORIDA.—Hon. W. B. Henderson, President, Tampa; Joseph Y. Porter, M. D., State Officer, Jacksonville.

The Secretary summarizes, in "Health Notes" for March, the mortality in the State for January: 45 counties and 5 cities, with an aggregate population of 391,422; deaths reported, 312. Of these 312 deaths, 45—about one-sixth—had attained the scriptural "three score and ten"—over seventy years old, when they died; 85, or one-third of the remainder, were children who died before reaching their fifth year. The obvious conclusion is that the mortality during middle life in Florida is very low—as it is.

The cities of Jacksonville, Pensacola, Tampa and Ocala are not included in this summary, but are reported separately.

Key West, virtually the whole of Monroe County, 18,786. Deaths, 30.

A bill recently introduced in the legislature proposing to transfer to the Marine Hospital Service all the quarantine stations, buildings, etc., in this State, is being generally discussed by the press. It is opposed by the State Health Officer, but contended for in the legislature on economical grounds. The efficiency of the State health service is not called in question, but equal efficiency is claimed for the Marine Hospital Service, without expense to the State.

Pensacola, 15,000. B. R. Pitt, President of the Board of Health, reports for April, deaths, 16. Under five years of age, 3. Death rate, 12.8.

ILLINOIS.—L. Addelsberger, M. D., President, Waterloo; J. W. Scott, Secretary, Springfield.

Springfield, April 22: The new State Board met and reorganized by electing Dr. L. Addelsberger of Waterloo as president, and Dr. Florence Hunt of Chicago as treasurer. Dr. J. W. Scott, the present secretary, was continued in office for the present.

Chicago, 1,619,226. William R. Kerr, Commissioner. Report for March: Deaths, 1,921—688 under five years of age. From diphtheria, 57; typhoid fever, 41; consumption, 191; pneumonia, 242; bronchitis, 125; measles, 20. Annual death rate, 14.22.

April 21: The Department has been reorganized: Arthur R. Reynolds, M.D., Commissioner of Health, in place of William R. Kerr, whose term had expired; F. W. Reilly, reappointed Assistant Commissioner.

INDIANA.—H. Jamerson, M. D., President, Indianapolis; J. N. Hurty, M. D., Ph. D., Secretary, Indianapolis.

At a meeting of the Board, March 31, an order was issued calling the attention of physicians throughout the State to a statute requiring reports to the Secretary of the State Board, of all births and deaths which may occur under their supervision, with a certificate of the cause of death, and correlative facts as may be required in the blank forms furnished as provided in the act referred to.

The State Board Bulletin reports for the three months ending December 31st, 1896: Diphtheria, 1,741 cases, 508 deaths; scarlatina, 544 cases, 18 deaths; typhoid fever, 383 cases, 244 deaths; whooping cough, 40 cases, 13 deaths; measles, 507 cases, 9 deaths; consumption, 399 deaths; pneumonia, 247 deaths. Total mortality, 3,889.

IOWA.—E. H. Carter, M. D., President, Des Moines; J. F. Kennedy, M. D., Secretary, Des Moines.

The State Board bulletin for April, reports since preceding: Diphtheria, 14 localities; scarlatina in 9; measles in 10; epidemic in Cedar Rapids.

A recent revision of the health law provides that no one of the seven physicians of whom the board is constituted can be in any way connected with any medical college.

Davenport, 35,000. A. W. Cantwell, M. D., Physician, reports for April: Number of deaths, 38—11 under five years of age. Death rate per 1,000, 14.4.

KANSAS.—Topeka (Capital) May 6: "The Hutchinson Women's Federation" appears to be alive to practical sanitation, though, as we have before noted, the State sanitation is no longer deemed necessary by the legislature. At a meeting of the "Federation," held at Topeka, May 5th, Dr. Harriet Comstock, of Hutchinson, read a strikingly practical paper on "A Plea for Better Sanitation," and Mrs. Clara Marley, of Olathe, spoke on the dangers of dust in the household and round about, and the special liability of milk to contamination by the bacteria-bearing dust. The unsanitary condition common to school rooms and churches was also held up as a menace to the health of school children and church people.

KENTUCKY.—Joseph Matthews, M. D., President, Louisville; John N. McCormick, M. D., Secretary, Bowling Green.

The annual meeting of the Board was held at Louisville, April 29. The chief subjects of discussion were, the need of funds to prosecute the work of the Board for the protection of the public health, the special need of a bacteriological laboratory, and the great work of ridding the State of the charlatan and quack, who play upon the credulity of the people and rob them of both money and health. "There has been nothing to disturb the equinimity until the last few months, when there has crept into the State a set of persons calling themselves 'Osteopaths.' No effort has been made to disturb them until it could be ascertained what their methods were. There can be no doubt but that they are evading the medical practice act, which distinctly says that no one shall be allowed to practice medicine or surgery in this State who has not been given a certificate by this Board. These people pretend to set fractures and reduce dislocations, which, granting their assertions is practicing surgery."

The Secretary reported the progress of bacteriological work undertaken by the Board, notwithstanding its straitened circumstances. He urged the continued necessity for additional legislation providing for the collection of vital statistics. The present law is valueless and impracticable, and yet it entails almost the same expense upon the State and counties as an efficient law. This matter has been urged upon the General Assembly again and again without success, but a more comprehensive bill than has yet been suggested would be considerately received, if its merits could be brought to the attention of members by their medical constituents. Almost the same suggestions are repeated in regard to the pollution of the water courses in Kentucky. The experience had in Europe, and in some of our older States, in which streams, invaluable because they were the only available sources of water supply for densely inhabited areas, were converted into open sewers, threatens to be repeated here. These evils can be prevented in Kentucky now at small cost, while for their cure, when securely fastened upon us, millions will be required. A little legislation and much painstaking supervision is needed upon this point.

LOUISIANA.—R. S. Oliphant, President, New Orleans; G. F. Patton, M. D., Secretary, New Orleans.

New Orleans, 275,000—80,000 colored. Deaths in March, 482; colored, 194; 126 under five years of age, 52 colored. Deaths from consumption, 72; pneumonia, 49; bronchitis, 15; influenza, 5; diphtheria, 3. Death rates—Whites, 17.72; colored, 29.20: 21.05.

April 9: The Board took up the subject of the bankrupt sewerage system, yesterday, and with the hope of reviving the work adopted the following:

Whereas, We regard the early construction of the sewerage system of vital importance to the health of this community, and as the first step towards securing improvements in local sanitation, be it

Resolved, That the Board of Health request the proper authorities to at once take such steps as are necessary to secure an early completion of the system.

MAINE.—C. D. Smith, M. D., President, Portland; A. G. Young, M. D., Secretary, Augusta.

Biddeford reports (*Journal*), May 15, deaths for the year ending Februarly 1, 1897, 369. The number of still births was 32. Deaths from zymotic diseases were as follows: Cholera infantum, 36; cerebro-spinal meningitis, 2; diphtheria, 5; dysentery, 2; influenza, 1; measles, 1; membranous croup, 3; typhoid fever, 17; whooping cough, 1; phthisis, 26. Cases of typhoid fever reported, 54. A mortality of 17 from this number is so extraordinary as to justify the belief that there were more than 54 cases. The previous year's report referred to was 96 cases, with 13 deaths.

"No city can boast of a high degree of sanitary excellence, with an important and inadequate sewerage system; such is the condition of our city at this time; some streets without any, and sections in many others sadly in need of a proper sewerage. In many parts of the city there is no outlet for sink drainage, except the obnoxious cesspool in the rear garden or yard which frequently becomes a surface nuisance and a source of constant danger to the health of all in the immediate vicinity."

With such conditions typhoid fever may be expected to continue.

MARYLAND.—John Morris, M. D., President, Baltimore; John S. Fulton, M. D., Secretary, Baltimore.

Baltimore, 506,398—73,344 colored. James F. McShane, M. D., Health Commissioner, reports for March. The weather: The mean barometric pressure during March was 30.09 inches; mean temperature 45°; total precipitation 2.40 inches, a deficiency in precipitation during the month of 1.70 inches; prevailing direction of wind, west.

Mortality.—The total deaths were 865, an increase of 162 compared with the corresponding month of March, 1896. Of these 663 were whites and 232 colored; a death rate of 17.67 per thous-

and for the former and 37.12 per thousand for the latter. The death rate per thousand for the whole population was 20.51. 37 died from infectious diseases, 127 from consumption, 104 from pneumonia, 28 from influenza, 28 from bronchitis, 15 from Bright's disease, 47 from heart disease, 35 from nephritis, 32 from apoplexy, and 6 from typhoid fever. 258 or 29.82 per cent. of the total deaths were in children under five years of age.

Cases of infectious diseases reported during the month, 316; an increase of 98 compared with the preceding month. One hundred and nineteen deaths occurred in public institutions, of which thirty-one were reported as non-residents.

MASSACHUSETTS.—H. P. Walcott, M. D., Chairman, Cambridge; S. W. Abbott, M. D., Secretary, Boston.

Boston, 501,083. Samuel H. Durgin, M. D., Chairman of Board of Health.

During the month of March there were 1,082 deaths, of which number 318 were under five years of age. Annual death rate, 25.11 per 1,000. Deaths from diphtheria (and croup), 47; scarlatina, 16; typhoid fever, 9; cerebro-spinal meningitis, 8; influenza, 12; consumption, 142. Cases reported: Diphtheria, 338; scarlatina, 228; measles, 865; typhoid fever, 24.

MICHIGAN.—Hon. Frank Wells, President, Lansing; Henry B. Baker, M. D., Secretary, Lansing.

For the month of April, 1897, compared with the preceding month, measles and intermittent fever increased and pneumonia and tonsilitis decreased in area of prevalence.

For the month of April, 1897, compared with the average for April in the eleven years, 1886-1896, measles and pleuritis were more prevalent, and intermittent fever, consumption, pneumonia, inflammation of kidneys and diarrhoea were less prevalent.

Including reports by regular observers and others, consumption was reported present in Michigan in the month of April, 1897, at 166 places; measles at 162 places, diphtheria at 49 places, scarlet fever at 42 places, typhoid fever at 28 places, whooping cough at 10 places and smallpox (suspected) at *one* place.

Reports from all sources show consumption reported at 13 places less, measles at 14 places more, diphtheria at 15 places less, scarlet fever at 5 places less, typhoid fever at 4 places less and whooping cough at 14 places less in the month of April, 1897, than in the preceding month. Smallpox was reported present at the same number of places.

Detroit, 275,000. S. P. Duffield, M. D., Health Officer, annual report for 1896: Deaths from consumption, 415; from pneumonia, 279; from diphtheria, 210; from scarlet fever, 25; typhoid fever, 66; smallpox, 11. Dr. Duffield will point out the remarkable mortality caused by pneumonia and consumption. These he ascribes chiefly to the extremely rigorous climate, which has greatly changed in the past fifty years because of the cutting down of pine forests of the State.

MINNESOTA.—Franklin Staples, M. D., President, Winona; H. M. Bracken, M. D., Secretary, St. Paul.

Minneapolis, 225,602.—H. N. Avery, M. D., Commissioner, reports for March: Deaths, 189—39 under five years of age. Deaths from diphtheria, 1; consumption, 25; typhoid fever, 35. Annual death rate, 8.47.

St. Paul, 215,582—A. J. Stone, M. D., Commissioner. Mortality for March, 140—37 under five years of age. Deaths from typhoid fever, 2; diphtheria, 3; consumption, 23; pneumonia, 19. Annual death rate, 7.78.

MISSOURI.—F. J. Lutz, M.D., President, St. Louis; Paul Paguin, M. D., Secretary, St. Louis.

St. Louis, 600,000—35,000 colored. M. C. Starkloff, M. D., Commissioner of Health, reports for March: Deaths, 903—216 under five years of age; from zymotic diseases, 53; diphtheria, 1; whooping cough, 5; typhoid fever, 7; phthisis, 127; pneumonia, 205. Annual death rate, 18.0.

Kansas City, 165,000. E. Von Quast, M.D., Health Officer, reports for March: Deaths, 181—52 under five years of age. Deaths from diphtheria, 3; typhoid fever, 1; phthisis, 12; tuberculosis, 14; pneumonia, 31. Annual death rate, 13.16.

MONTANA.—Butte, 47,000. F. W. McCrimmon, M. D., Health Officer, reports for the year ending April 30, deaths 513; still births 29. Death rate, 10.91.

NEBRASKA.—J. V. Beghtol, M. D., Friend; F. D. Haldeman, M. D., Secretary, Ord.

Omaha, 140,452. J. W. Blythin, M. D., Commissioner, reports for March 79 deaths, of which number 35 were under five years of age. There were 10 cases of diphtheria, 2 deaths; scarlatina, 18 cases; measles, 220 cases, 8 deaths; typhoid fever, 2 deaths; consumption, 8 deaths. Annual death rate, 6.77 per 1,000.

NEW JERSEY.—C. F. Brackett, M. D., President, Princeton; Henry Mitchell, M. D., Secretary, Asbury Park.

From the twentieth annual report, for the year ending June 30th, 1896, the following statistics are taken. Estimated population, 1,718,543; total mortality, 30,767—11,759 under five years of age. Death rate per 1,000 for the year, 17.90—the lowest recorded in the past eight years. Consumption caused 3,758 deaths; diarrhoeal diseases of children, 3,807; diphtheria, 1,758; typhoid fever, 577; scarlatina, 183; whooping cough, 275; measles, 390; smallpox, 2; malarial fevers, 119. Of 438,969 children enrolled in the public schools, 94,481—more than 21 per cent. were found to be unvaccinated.

Newark, 230,000. Health Officer Chandler reports for the three weeks ending May 1: Deaths, 234—50 under five years of age; from diphtheria, 3; consumption, 40; pneumonia, 26; other respiratory diseases, 23. Annual death rate, 17.92.

Hudson County (Jersey City and vicinity), 355,231. W. W. Varick, M. D., President.

In the month of March there were 642 deaths, of which 228 were under five years of age. Annual death rate per 1,000, 21.7. Typhoid fever caused 6 deaths; diphtheria, 29; measles, 7; scarlatina, 8; all zymotic diseases, 62; consumption, 60; pneumonia, 139.

NEW YORK.—Daniel Lewis, M. D., President, New York; B. T. Smelzer, M. D., Secretary, Albany.

The Secretary's bulletin for March reports that the daily average death rate of 350 in February, with a death rate of 19.00 per 1,000 population, increased to 373, the death rate being 20.50, representing an annual mortality for the State of 135,000. Compared with March, 1896, there was then a daily mortality of 358, or 15 less than this month, and a death rate of 20.00. The relative infant mortality for each of the three periods is the same, but the zymotic mortality is less, having the unusually low rate of 9.21 per cent. of the total deaths. Acute repiratory diseases, on the other hand, have caused an unusually large number of deaths, 2,484, or more than one-fifth of the total mortality being from this cause. The epidemic of grippe, which began in January and prevailed mildly for that and the following month, has increased in severity in March, showing itself in the increased number of deaths above the normal from respiratory and other local diseases; and it may be estimated to have caused at least 1,500 deaths. Among local diseases there is a notably large mortality from diseases of the circulatory organs, and it is in March that their average mortality is

highest. Diseases of the nervous system also cause, as is likewise usual in the spring months, a high mortality, though less than in July. Among zymotic diseases, diphtheria has the same prevalence as in last month and in March, 1896, with 370 deaths. Whooping cough and measles show a moderate increase, and are both of them generally distributed throughout the State. Scarlet fever caused but 10 deaths outside of the Maritime district. In rural parts of the State the rate of mortality to population from acute respiratory diseases was identical with that of the urban and village mortality, while that from consumption was as 15 to 19; in the entire State 22.2 and 10.2 per cent. of all the deaths were from these causes respectively. The average mean temperature of the month was 33°, or 2° above the normal, with ranges from zero to 58°; the precipitation of 3.20 inches was slightly in excess, and the prevailing winds west and southwest.

It is reported (Albany *Argus*, April 9), that Engineer Rudolph Herring has secured the permission of the State Board of Health to a plan which provides for the establishment of an entire new sewage system in Cohoes which will have as its outlet the Hudson River opposite Cohoes. This seems incredible, for if true it means that Cohoes will shortly be emptying its entire sewage into the Hudson River, by approval of the State Board of Health.

New York City, 1,905,000. Report for March: Deaths, 3,638—1,503 under five years. Death rate, 21.5. Zymotic diseases, per 1,000 from all causes, 11.05; diphtheria, 167; typhoid fever, 9; cerebro-spinal fever, 22; consumption, 406; acute respiratory diseases, 752; diarrhoeal diseases, 43. For the four weeks ending April 23 the school inspectors found 29,091 children set aside by their teachers as fit subjects for medical examination. Of these 1,400 were sent home for various reasons. Among them the 1,400 had every disease that childhood is heir to.

Brooklyn, 1,100,000. Report for March: Deaths, 2,027—690 under five years. Death rate, 21.5 From zymotic diseases, per 1,000, from all causes, 113; diphtheria, 90; typhoid fever, 7; consumption, 214; acute respiratory diseases, 463.

Residents of Springfield complain of the hardship of having been prohibited the privilege of dumping their garbage and other filthy refuse into the tributaries of the Brooklyn reservoirs. They have been notified to remove at once all stables and pig pens from the danger limit, and as some of the lots are only 150 feet deep, with privy vaults in the rear, the owners say they may as well sell out, as some portions of their houses are on the prohibited strip.

Buffalo, 350,000. Report for March: Deaths, 411—147 under five years. Death rate, 14.5. From zymotic diseases, per 1,000 deaths, from all causes, 170.3; diphtheria, 18; acute respiratory diseases, 85; consumption, 43; typhoid fever, 10.

Rochester, 170,000. Report for March: Deaths, 223—50 under five years. Death rate, 15.7. From zymotic diseases, per 1,000 deaths, from all causes, 76.25; consumption, 19; acute respiratory diseases, 31; diphtheria, 5.

Albany, 100,000. Report for March: Deaths, 235—56 under five years. Death rate, 27.7. From zymotic diseases, per 1,000 deaths, from all causes, 104.35; typhoid fever, 7; diphtheria, 8; consumption, 31; acute lung diseases, 52.

NORTH CAROLINA.—George G. Thomas, M. D., President, Salem; Richard H. Lewis, M. D., Secretary, Raleigh.

April bulletin summarizes reports from 24 towns, with an aggregate population of 73,172 white and 55,213 colored, for the month of May: Deaths, 51 white, 100 colored—38 under five years of age. Death rates, respectively, 8.4, 21.7: 15.1. The chief causes were: From consumption, 37, 25 colored; pneumonia, 16, 12 colored; heart disease, 9; brain diseases, 10.

Meteorological summary for the month: Mean barometer 30.12 inches; normal for March 30.06. Highest barometer 30.69 on the 1st at Kittyhawk. Lowest barometer 29.42 on the 24th at Kittyhawk. Mean temperature 51.9 degrees; normal for March 48.1. Highest temperature 86 on the 21st at Tarboro and Southern Pines. Lowest temperature, 15° on the 28th, at Highlands. Average rainfall 5.56 inches; normal for March 4.54 inches. Greatest monthly rainfall 11.98 inches at Murphy; least monthly rainfall 1.23 inches at Wilmington. Average number of clear days, 8; partly cloudy, 8; cloudy, 15; rainy, 13. Prevailing wind direction southwest. Average hourly velocity 9.6 miles per hour. Normal direction for March southwest; normal velocity 9.5 miles per hour.

OHIO.—S. P. Wise, M. D., President, Millersburg; C. O. Probst, M. D., Secretary, Columbus.

Cases of and deaths from infectious diseases reported to the State Board of Health during the four weeks ending March 27, 1897: Diphtheria, 113 cases, 28 deaths; scarlatina, 93 cases, 5 deaths; typhoid fever, 70 cases, 15 deaths; whooping cough, 37 cases, 4 deaths; measles, 650 cases, 3 deaths. Aggregate population represented, 1,152,622.

Cincinnati, 405,000. J. W. Prendergast, M.D., Health Officer, reports for March: 502 deaths—130 under five years of age. Annual death rate, 14.87. From consumption, 78; pneumonia, 73; bronchitis, 24; zymotic diseases, 43—diphtheria, 10; typhoid fever, 5.

Cleveland, 350,000. J. L. Hess, M. D., Health Officer, reports for March: Deaths, 423—166 under five years. From diphtheria, 8; typhoid fever, 7; consumption, 28; tuberculosis, 19; pneumonia, 43; bronchitis, 20. Death rate, 14.50.

Toledo, 137,780. J. T. Woods, M. D., Health Officer, reports for March: Deaths, 152—42 under five years of age. Death rate, 13.3. Deaths from consumption, 7; diphtheria, 4; typhoid fever, 2.

PENNSYLVANIA.—Pemberton Dudley, M. D., President, Philadelphia; Benjamin Lee, M. D., Secretary, Philadelphia.

There are now in this State 25 city Boards of Health and 532 borough boards. The jurisdiction of these boards covers probably not more than one-twentieth of the area of the State, leaving more than 40,000 square miles of its territory still unprotected by local boards of health. The present population of the State is estimated to be fully 6,000,000. Not more than one-half of this vast population is yet under the sanitary care of local health boards; though the act of May 11, 1893, "To enable borough councils to establish boards of health," has wrought great and beneficent changes in this respect.

The prominent "*sanitary need*" of the State is a greatly increased appropriation to carry on its sanitary work. The law under which this Board was established enjoins upon it no more urgent or imperative duty than that of urging a greatly increased appropriation to the Board's working fund. Pennsylvania devotes but $6,000 to internal sanitation, while New Jersey appropriates $16,000. New York $30,000, and Massachusetts $49,000.

Philadelphia, 1,188,793. Theodore B. Stulb, Health Officer, reports for four weeks ending April 24: Deaths, 1,860—604 under five years of age. From diphtheria, 102; typhoid fever, 28; consumption, 200; pneumonia, 280.

Pittsburg, 285,000. Report for the four weeks ending April 24: Deaths, 341—133 under five years of age; typhoid fever, 14; consumption, 23; diphtheria, 3. Death rate, 15.55.

The officials at the colliery of Markle & Company, at Jeddo, where a majority of the heads of the afflicted families are employed,

have issued orders that they must be suspended until the epidemic abates. Several cases were reported to the colliery physicians at Jeddo to-day.

RHODE ISLAND.—A. G. Sprague, M. D., President, River Point; Gardner T. Swarts, M. D., Secretary, Providence. February bulletin reports contagious diseases for January, 1897: Diphtheria, 103; scarlatina, 89; typhoid fever, 17.

SOUTH CAROLINA.—Charleston, 65,165—white, 28,870; colored, 36,295. H. B. Horlbeck, M. D., Health Officer, reports for four weeks ending April 24: Deaths, 109—79 colored. Under five years of age, 36. Annual death rate—white, 13.5; colored, 28.0: 20.7.

TENNESSEE.—J. D. Plunket, M. D., President, Nashville; J. Berrien Lindsley, M. D., Secretary, Nashville.

The Secretary's bulletin of March 20 reports: The principal diseases, named in the order of their greater prevalence in the State, for the month of March, were: Lung diseases, acute, la-grippe, measles, consumption, whooping cough, malarial fever, typhoid fever, rheumatism, mumps, diphtheria, and smallpox.

Nashville, April 25th: The new State Board appointed, and organized 9th inst., is as follows: J. A. Albright, M. D., President, Somerville; Sam. N. Warren, Vice President, Spring Hill; W. J. Miller, M. D., Johnson City; W. J. McMurray, M. D., Nashville; Hon. T. F. P. Allison, Nashville; J. Berrien Lindsley, M.D., Secretary and Executive Officer, Nashville; John S. Hamel, Assistant Secretary, Nashville; J. W. Scheibler, M. D., State Veterinarian, Memphis; Ernest B. Sangree, M. D., State Bacteriologist, Nashville.

Dr. J. A. Albright, the new President, is a native of North Carolina. He was educated in Graham Normal college and the University of North Carolina. He received his medical education at the College of Physicians and Surgeons and the Johns Hopkins University at Baltimore, graduating in 1882. He has lived in Fayette county for a number of years.* He is at present a resident of Somerville, and is President of the County Board of Health of that county. He is a member of the Carmack Democratic Congressional Committee of the Tenth District.

Mr. Samuel N. Warren, the live stock representative on the Board and the Vice-President, is one of the most prominent Jersey cattle breeders in the State and has long been a leading spirit in all

movements for the development of the live stock interests of the State.

Dr. W. J. Miller, has been a medical practitioner for twenty years, and is held in high repute.

Memphis, 56,134—27,561 colored. Board of Health reports for April: Deaths, 100—43 white and 57 colored. Of these 42 died of general diseases, 11 of nervous diseases, 9 of circulatory diseases, 2 of respiratory diseases, 12 of digestive diseases. Annual death rate, per 1,000, including non-residents, white, 15.54, colored, 24.81; total, 21.19. Of residents only, white, 11.75; colored, 20.30; total, 15.82.

UTAH.—Salt Lake City, 48,076. W. T. Talby, M. D., Commissioner, reports for March, 49 deaths—11 under five years of age. Annual death rate per 1,000, 12.2. From consumption, 7; diphtheria, 1; typhoid fever, 1; pneumonia, 9.

WISCONSIN.—Solon Marks, M. D., President, Milwaukee; U. O. B. Wingate, M. D., Secretary, Milwaukee.

Milwaukee, 275,000. Walter Kempster, M. D., Commissioner of Health reports for March: Deaths, 335—128 under five years of age. From diphtheria, 11; measles, 6; consumption, 29. Annual death rate, 14.62 per 1,000.

SMALLPOX AND YELLOW FEVER IN CUBAN PORTS.

By latest number of "Public Health Reports," at the time of this writing (May 21), as follows: May 15th: The United States Sanitary Inspector at Havana reports that during the week ended May 13th, there were in that city 14 deaths from yellow fever, with 54 new cases; and 80 new cases of smallpox, with 11 deaths. May 12th: The United States Consul at Cardenas reports that during the week ended May 8th, there were in that city 8 new cases and 2 deaths from yellow fever, and 10 cases and 1 death from smallpox. May 7th: The United States Consul at Matanzas reports that during the week ended May 5th, there were in that city no deaths from smallpox and 1 death from yellow fever; the United States Consul at Manzanillo reports that during the two weeks ended April 15th, there was in that city 1 death from yellow fever. May 10th: The United States Consul at Sagua la Grande reports that during the week ended May 8th, there were in that city 25 new cases of yellow fever; deaths not reported. May 8th: The United States Sanitary Inspector at Santiago reports that during the week ended May 8th, there was in that city 1 death from yellow fever.

Havana.—During the week ended May 13th, there were 214 deaths in this city from all diseases, 14 of which were caused by yellow fever, with approximately 54 new cases; 11 were caused by smallpox, with 80 new cases, approximately; 5 were caused by so-called pernicious fever, 7 by enteric fever, 2 by malarial fever, 11 by dysentery, 21 by enteritis, 1 by diphtheria, 3 by pneumonia and 40 by tuberculosis.

Thirteen of the deaths during the week from yellow fever were among Spanish soldiers in the military hospitals, the remaining one being a civilian. Nine of the deaths from smallpox were among civilians, while the remaining two were Spanish soldiers.

D. M. BURGESS,
Sanitary Inspector U. S. M. H. S.

THE BUBONIC PLAGUE SPREADING.

LONDON, May 14—[By Cable to The Herald].—A dispatch to the Daily Mail from Bombay says that the bubonic plague is making fearful ravages in the Cutchmandvi district, where there have been 2,000 deaths in a fortnight. Half the population has fled.

BOOK REVIEWS.

WATER AND PUBLIC HEALTH.—The Relative Purity of Waters from Different Sources. By James H. Fuertes, Member of the American Society of Civil Engineers. 12mo. Seventy figures. $1.50. New York, John Wiley & Sons: London, Chapman & Hall.

Multum in parvo, is applicable to this book in an extraordinary degree. It is the gist of a subject of interest to everybody—drinking water. A veritable eye-shot, showing the relation of impure water to disease.

Figures and deaths show the typhoid fever death rates and the annual precipitation for the years 1890-1895, inclusive, for many American cities. But besides this relation, the fact made evident that all these supplies are liable to pollution by the surface washings, or by percolation towards the water-supply sources; that is to say, the more rainfall the more polluting matter is washed into the source of supply.

In Boston, Cleveland, Columbus, Detroit, Louisville, New York, Paterson, Pittsburgh, San Francisco, and Toledo, a re-

markable parallelism is shown between the typhoid curves and the rainfall curves; in years of high rainfall typhoid was high, with but one or two exceptions. These cities represent many classes of water—supplies drawn from impounding reservoirs, lakes, small surface gathering-grounds, large normal rivers, and sewage-polluted rivers—and follow a law directly opposite to that followed by Munich, Hamburg and Altona.

MANUAL OF AMERICAN WATER-WORKS.—Compiled from Special Returns. Containing the History and Descriptions of the Sources and Modes of Supply, Pumps, Reservoirs Steam-pipes, Distribution Systems, Pressures, Consumption, Revenue and Expenses, Cost, Debt and Sinking Fund, etc., etc., of the Water Works of the United States and Canada, with Summaries for each State and Group of States, and Water Rates Charged in over 1,250 Cities and Towns. Edited by M. N. Baker, Ph. B., Associate Editor of Engineering News. 8vo. pp. 622. New York: Engineering News Publishing Co.

The title page of this comprehensive work clearly indicates its scope. It describes all water works completed, under construction, or projected in the United States and Canada up to the close of 1896, with later information concerning some new works and projects.

DISEASES OF THE EAR, NOSE AND THROAT AND THEIR ACCESSORY CAVITIES.—A condensed Text-book. By Seth Scott Bishop, M. D., LL.D., Professor in the Chicago Post-Graduate Medical School and Hospital; Surgeon to the Illinois Charitable Eye and Ear Infirmary; Consulting Surgeon to the Illinois Masonic Orphans' Home and to the Silver Cross Hospital of Joilet; formerly Surgeon to the South Side Free Dispensary and to the West Side Free Dispensary; Member of the International Medical Congress, The Pan-American Medical Congress, The American Medical Association, The State Medical Societies of Illinois and Wisconsin, The Chicago Pathological Society, etc. Illustrated with 100 Colored Lithographs and 168 Additional Illustrations. One Volume, Royal Octovo, pages xvi-496. Extra Cloth, $4.00, net; Sheep or Half Russia, $5.00, net. The F. A. Davis Co., Publishers, 1914 and 1916 Cherry Street, Philadelphia; 117 W. Forty-second Street, New York; 9 Lakeside Building, Chicago.

A work adapted to the needs of medical students and general practitioners on the specialties designated in the title, together

with a lucid description of the latest developments concerning diphtheria and the blood-serum therapy; the medical and surgical management of mastoid diseases, the successful treatment of hay fever, the improved compressed-air instruments, vaporizing apparatus, inhalents, etc.

The colored lithographs and other illustrations are admirably executed, and the work altogether a thoroughly up-to-date treatise, alike commendable to medical students and practitioners.

THE IDEAL PROTECTION.—By William T. Standen, Actuary, with Introduction by George H. Burford, Esq., President of the United States Life Insurance Company, New York. 8vo., pp. 264. New York: United States Life Insurance Company.

An entertaining and instructive collection of editorials, essays and addresses on the advantages of Life Insurance. Of the more important essays, worthy of particular attention are: "Life Insurances Abuses—their Causes, effects and Suggested Remedies;" "Effect of 'Occupation' and 'Habits' on Life Insurance Risks;" "Some Thoughts on Mortality and Medical Selection of Lives."

ANNUAL REPORT OF THE BOARD OF REGENTS OF THE SMITHSONIAN INSTITUTION.—Showing the Operations, Expenditures and Condition of the Institution to July, 1894. Washington Govment Print.

The special papers and reports on and by original investigations appended to the general report number about forty. Among the most interesting and important of which are: "Light and Electricity, according to Maxwell and Hertz," by M. Poincaré; "The Age of Electricity," by M. Mascart; "Terrestrial Magnetism," by Prof. A. W. Rucker; "Weather Making, Ancient and Modern," by Mark W. Harrington; "The Promotion of Further Discovery in the Arctic and the Antarctic Regions," by Clements R. Markham; "The Influence of Certain Agents in Destroying the Vitality of the Typhoid and of the Colon Bacillus," by John S. Billings and Adelaide Ward Peckham; "The Founding of the Berlin University and the Transition from the Philosophic to the Scientific Age," by Rudolph Virchow.

WARNER'S POCKET MEDICAL DICTIONARY. By William R. Warner & Co., Philadelphia.

A very complete list of medical terms in common use, with which all medical students have need to become familiar. It is especially commendable to students for class-room use and to the

profession at large to whom a larger dictionary is frequently inconvenient and impracticable because of its bulk.

MUNICIPAL AFFAIRS is among the most welcome of recent additions to our exchange list. A quarterly publication of the "Bibliography of Municipal Administration and City Conditions," Edited by Robert C. Brooks, $1.00 per annum. New York: Reform Club, 52 William Street.

SMALLPOX AND VACCINATION.—By Dr. Sundori Mohan, D. A. S., M. B., Lecturer on Hygiene, Calcutta Medical School; Medical Inspector, Calcutta Municipal Corporation. Price Re. 7. Calcutta: Law Publishing Press, 57 Bow-Bazar Street.

A brochure of one hundred pages, comprehending an historical sketch of smallpox from the earliest records in India and China, and of its terrible ravages in the middle ages. It deals with the ethiology, mode of dissemination, symptoms and course, complications, varieties, prognosis, treatment and morbid anatomy. Part 2—Prophylaxis; prevention, influence of disinfection and other sanitary measures; vaccination—its history, and its protective power in India and elsewhere.

PAMPHLETS, REPRINTS, ETC., RECEIVED.

"Mineral Waters of Mt. Clemens, Mich.," Dr. Richard Leuschner, Mt. Clemens, Mich.

"Nasophine and Antinasene," Claude A. Dundore, M.D., Philadelphia.

"Results of (Chemical) Electrolysis vs. Divulsion in the Treatment of Urethral Strictures." Robert Newman, M.D., New York.

"Brookline Public Bath; Description and Report of Building Committee." Riverdale Press, Brookline, Mass.

"The Technique of Blood Study and Experiments in the Physiological Chemistry of Leucocytes." A. Mansfield Holmes, M.D., Denver, Col.

"The Importance of Systematic Microscopical Examination of the Uterine Scrapings as an Aid to Diagnosis." Hunter Robb, M.D., Cleveland, Ohio.

"The Bacillus Proteus Zenkeri in an Ovarian Abscess." Ibid and A. A. Ghriskey, M.D., Cleveland, Ohio.

"Unfiltered Surface Waters Always Unsafe for Town Supply." Henry Leffman, M.D., Philadelphia.

"Cancer of the Rectum." James P. Tuttle, M.D., New York.

"Strophanthus; a Clinical Study." Reynold W. Wilcox, M.D., New York.

"Ectopic Gestation." H. J. Boldt, M.D., New York.

"Should the State Take Action to Regulate the Administration of Anaesthetics." Ibid. "Causes of Death After Abdominal Section." Ibid. "Vaginal Extirpation of the Uterus and Adnexa." Ibid.

"The Practice of Medicine as a Money-Making Occupation." Professor Stanford E. Chaillé, M.D., New Orleans, La.

"The Use of Anti-Toxic Serum in the Treatment of Diphtheria." Herman M. Biggs, M.D., and Arthur R. Guerard, M.D., New York.

"Difference Between Serum and Blood Solutions, the Condition of the Test-Culture and the Significance of Bacterium Coli Inspection in Relation to Typhoid Diagnosis." Wyatt Johnson, M. D., and D. D. McTaggart, M.D., Montreal, Can.

"Gonorrhoeal Iritis and Non-Suppurative Gonorrhoeal Conjunctivitis." William Cheatham, M.D., Louisville, Ky.

"The Treatment of Syphilis." L. Bolton Bangs, M.D., New York.

"The Treatment of Extra-Uterine Pregnancy." Howard Kelly, M.D., Baltimore, Md.

"Plumbing Simplified." Paul Gerhard, C. E., New York.

"The Opportunities and Responsibilities of Modern Medicine." Algernon Y. Bristow, M.D., Brooklyn, N. Y.

"The Charcoal Dressing in Military Surgery." S. Sherwell, M.D., Brooklyn, N. Y.

"The Necessity for the Complete Extirpation of Tumors." Frederick Holme Wiggin, M.D., New York.

"Practical Skiascopy." A. J. Cross (R. O.), New York.

"Rectal Ulcers and the Electro-Cautery." William M. Beach, M. D., Pittsburg, Pa.

"Microscopical Proof of a Curative Process in Tuberculosis;" and "My Latest Improved Binaural Stethoscope." Charles Denison, M.D., Denver, Col.

"Special Forms of Rectal Fistulae." William M. Beach, M.D., Pittsburg, Pa.

"Experimental Study of the Respiratory Function of the Nose." J. L. Goodale, M.D., Boston, Mass.

"The Want of College Instruction in Electro-Therapeutics." Robert Newman, M.D., New York.

"Serum-Therapy as Applied to Diphtheria." Frank W. Wright, M.D., New Haven, Conn.

"Notes on the Treatment of Faecal Fistula." Frederick Holme Wiggin, M.D., New York.

"Objections to and Criticisms on the Majority Report of the Committee of the Medico-Legal Society on the Existing Laws for the Commitment of the Insane." Ralph Lyman Pårsons, M.D., New York.

"Practical Points Regarding the Senile Insane." Ibid.

"Mode of Procedure Under the New Lunacy Law." Ibid.

"Acute Suppurative Inflammation of the Middle Ear;" "Acute Suppurative Mastoiditis; Abcess of the Neck; Operation." Seth Scott Bishop, M.D., Chacago, Ill.

"A Clinical Study of 21,000 Cases of Diseases of the Ear, Nose and Throat." Ibid.

"Anti-Diphtheritic and Anti-Streptococcic Serum." C. C. Fite, M.D., New York.

"Diastare in Therapeutics." Ibid.

"Hay Fever; the Best Treatment for Stay-at-Homes." William Cheatham, M.D., Louisville, Ky.

"The Present Status of the Serum Treatment of Diphtheria." Ibid.

"Sunstroke Weather of 1896." W. F. R. Phillips, M.D., Washington. D. C.

Congenital Ptôsis. M. F. Coomes, M.D., Louisville, Ky.

"Report of a Case of Gastrastomy." Ibid.

"Primary Carcinoma of the Gall-Bladder." Dr. Gustave Fülterer, Chicago, Ill.

"The Rapid Cure of Gonorrhoea." Fred C. Valentine, M.D., New York.

"Protection of the Innocent." Ibid.

"When May Gonorrhoea Patients Marry?" Ibid.

"Urethroscopy in Chronic Urithritis." Ibid.

"Cyclone-Neuroses and Psychoses." Dr. Ludovic Bremer, St. Louis, Mo.

"Notes on Some of the Newer Remedies Used in Diseases of the Skin." L. D. Bulkley, M.D., New York.

INDEX.

Addison's Disease, Eitlenger, 54.
Aerotherapy in the Treatment of Disease, 137.
Altitude, Doubtful Effects of, for Consumptives, Maxwell, 316.
Altitude, Its Effects upon Different Individuals, Gove, 226.
A Maid's a Maid for A' That, 217.
Anderson, W. S., M. D., The Study of Crime and Degeneration, 435.
Antifat Patient, 451.
Appendicitis, Reclus, 447.
Arey, C. O., C. E., M. D., Water Supply and Sewage, 126.

Associations, Conventions, Etc.:
- American Medical Association, 480.
- American Medical Editors' Association, 480.
- Congress of American Physicians and Surgeons, 384.
- Fassett's Bureau of the Medical Press, 480.
- Tennessee Exposition, 383.
- Women's Health Protective Association, 357.

Bacilli, The Influence of, Varies with Age, 450.
Bacillus, A New, 467.
Bashore, H. B., M. D., The Cistern, 124.
Baths, Free Public, 424.
Beer and Typhoid Fever, 530.
Beer, Bad, 156.
Bell, A. N., A. M., M. D.
- Topography, Climate and Mineral Springs of Louisiana, 307.
- Topography, Climate and Mineral Springs of Mississippi, 219.
- Quarantine and Port Sanitation, 481.

Bell, C., Compulsory Vaccination, 19.
Bismuth, Subnitrate of, Poisonous, 542.
Brooklyn Day at Nashville, 544.

Book Reviews:
- Albany Medical Annals, 287.
- American Medico-Surgical Bulletin, 287.
- American Microscopical Journal, 287.
- Anaesthesia, W. Wood & Co., New York, 91.
- Annual of the Universal Medical Sciences, Sajous, 378.
- Ear, Nose and Throat, Diseases of, Bishop, 564.
- Education, Report of the Commissioner of, 279.
- Engineer, The, in Naval Warfare, 96.
- Good Health, 286.
- Home Journal, 94.

Index Catalogue, Library of Surgeon-General, U. S. A., 279.
International Medical Annual, E. B. Treat, New York, 475.
Laboratory Calculations, Adriance, J. Wiley & Sons, New York, 282.
Law of Public Health, H. L. Parker, M. Bender, Albany, 87.
Liquor Problem, Wines and Koven, Houghton, Mifflin & Co., Boston, 476.
Living Age, 286, 480.
Marine Hospital Service Report, 546.
Municipal Affairs, Brooks, 566.
New York State Commission in Lunacy, 283.
Non-Heredity of Inebrity, L. E. Keeley, Scott, Foresman & Co., Chicago, 89.
Notes for Chemical Students, Austen J. Wiley & Sons, New York, 283.
Oyster Culture in Relation to Disease, London, 282.
Physicians Visiting List, P. Blakiston, Son & Co., Philadelphia, 88.
Proceedings of Florida Medical Society, 378.
Protection, The Ideal, 565.
Public Baths and Public Comfort Stations, 281.
Purdue Society of Civil Engineers, S. Coulter, 91.
Review of Reviews, 285, 379.
Roentgen Rays, E. P. Thompson, D. Van Nostrand & Co., New York, 88.
Smallpox and Vaccination, Mohan, 566.
Smithsonian Institution, Annual Report, 565.
Texas Medical Practitioners, 480.
Transactions of Medical and Chirurgical Faculty of Maryland, 377.
Transactions of Medical Society of North Carolina, 376.
Vita Medica, Richardson, Longmans, Green & Co., London, 474.
Warner's Pocket Medical Dictionary, 566.
Water and Public Health, Fuertes, 563.
Water Works, Manual of, Baker, 563.

Boric Acid as a Food Preservative, 407.
Bromides, The Use of, Sterling, 350.
Brooklyn's Water Supply and Its Impurities, 248.
Brooklyn's Water Supply, More About, 353.
Bryn, H., M. D., Sanitaria for the Treatment of Tuberculosis in Germany and Switzerland, 427.
Building Material, Denis, 417.
Buildings, High, and Safe Elevators, 44.

Cassion Diease, 429.
Catsup, 320.
Cattle Plague in European Russia, 56.

Centennial City, The, 543.
Century Co. Prize, 383.
Charity, Public and Private, Principles of, 382.
Chloroform, Researches on, Reynier, 59.
Cholera Microbe, The, 242.
Cirrhosis, Pigmentary, Letulle, 349.
Cistern, The—A Substitute for the Country Well, Bashore, 124.
Civil Service Reform, Progress of, 479.
Climate of Palestine, 320.
Climatology, Medical, The Weather Bureau in Its Relations to, Easterday, 313.
Climatology, Topography and Mineral Springs of Louisiana, Bell, 307.
Climatology, Topography and Mineral Springs of Mississippi, Bell, 219.
Coal Mine, the, Death Record in, 186.
Coca Wine and its Dangers, 352.
Common Sense *vs.* Sentiment, 152.
Consumption, Conditions Favoring, 190.
Consumption, Fighting, 250.
Consumption, The Significance of Mortality from, with Regard to the Bicycle, 64.
Consumption, To Prevent, 263.
Consumption, Tubercular, To Control, 173.
Consumptive Physicians, Free Hospital for, 358.
Consumptives, Doubtful Effects of Atltitude for, Maxwell, 316.
Contagious Impetigo, Gotthiel, 62.
Corbally, T. P., A.M., M.D., Medical Excerpt, 58, 145, 241, 348, 446, 540.
Coughs, Laryngeal or Winter, Fleming, 351.
Court House, A Specimen, 455.
Criminals, Condemnation of, Not Punishment, 285.
Crime and Degeneration, The Study of, Anderson, 435.
Cuba, 473; Smallpox and Yellow fever, in, 562.
Cuban Allies, 151.

Debtor's Excuse, A Church, 141.
Degeneracy in Small Towns, Causes of, 192.
Denis, T., Building Material, 417.
DeSchweinitz, E. A., M. D., The War with the Microbes, 393.
Diphtheria in Adults, Gouguenheim, 348.
Diphtheria, The Causation of, MacKenzie, 33.
Diphtheritic Paralysis and Nerve Changes, 244.
Disinfection of Soiled Linen, 504.
Disinfection Plant, Ellis Island, 252.
Divorce, The Increase of, 93.
Douglas, C., M. D., Milk Poisoning, 128.

Easterday, J. S., M. D., The Weather Bureau in its Relation to Medical Climatology, 313.

Elevators, Safe, High Buildings and, 44.
Epilepsy, Preventive Treatment of, Lemoine, 58.
Epileptics, The Care of, 274.
Erythema Infectious, Gaillard, 446.
Fatigue, Mental, in Schools, 202.
Filtration, an Improved Method of, Mason, 289.
Financial Transaction, A, 50.
Fire Mantel, The Incandescent, Pye, 421.
Fish Poisoning, Brosch, 61.
Fogs, 189.

Food Adulteration and the Pure Food Food Law, Fremkel, 512.
Food Preservative, Boric Acid as a, 407.
Football, Deaths by, 91.
Fremkel, L. K., M. D., Food Adulteration and the Pure Food Law, 512.
Fruits, New Way of Ripening, 545.

Gas Poisoning, 359.
Going Slow, 92.
Gove, G. S., M. D., Altitude—Its Effect upon Different Individuals, 226.
Grant to Buckner, 478.

Haemokonia, 542.
Hams, Westphalian, 53.
Health and Comfort, 154.
Health Department of the Greater New York, Smith, 293.
Health Departments, Brooklyn and Buffalo, Comparison of, 454.
Health Public, Department of, 442.
Heart, the, First Sound of, 541.
Hidebound, The—Which?, 65.
Hill, J. W., C. E., The Water Supplies of Eight Cities in Relation to Typhoid Fever Rates, 531.
Holy-Stone, the, Passing of, 51.
Home of the Beautiful, Kenyon, 135.
Hospital, National Temperance, 65.
Housing Reform in New York City, 92.
Hydrophobia, The Pasteur Treatment of, 150.
Hygiene and its Accessories, Jacobi, 97.
Hygiene, The National Museum of, 116.
Hygienic Self Defense, Voorsanger, 195.

Ichthyol in Diseases of the Eye, 450.
Idiots, Special Memories in, 95.
Indians, How, are Named, 381.
Index, 569.
Infection of the Right Kind, 155.
Insanity and Phthisis, The Relation Between, Irwell, 321.

Insomnia, Neurasthenic, Dornbluth, 351.
Insured, the, Vital Statistics of, 473.
Intubation of the Larynx, Robert, 60.
Irrigation, The Civilizing Power of, 96.
Irwell, L., A.M., B. C. L., Racial Deterioration—The Relation Between Phthisis and Insanity, 321.

Jacobi, A., M. D., Hygiene and Its Accessories, 97.
Jam It, 406.
Jamaica, The English Administration of, 347.

Kenyon, J. B., The Home of the Beautiful, 135.
Knew What he Wanted, 57.

Law, J., Indiscriminate Slaughter of Cattle for Tuberculosis, 400.
Lee, B., M. D., State Medicine in Pennsylvania, 3.
Leprosy in Colombo, 184.
Litheasis and Gout, 451.
Lodge Doctoring, 66.
Lodging Houses, The Mills, 191.
Longevity of Long Islanders, 275.
Longevity, the Problem of, 95.
Louisiana, Topography, Climate and Mineral Springs of, Bell, 307.
Lungs, the, Surgery of, 148.

MacKenzie, W. L., M. D., The Causation of Diphtheria, 33.
Marriage Law, The New, 356.
Mason, F. H., An Improved Method of Filtration, 289.
Mason, W. P., Dangers of Sanitary Neglect at the Water Sheds from which come Supplies of City Water, 385.
Masonry, A Test of, Laid in Freezing Weather, 65.
Maxwell, G. T., M. D., Doubtful Effects of Altitude for Consumptives, 313.
Measles, Bacteriological Researches on, Barbier, 449.
Medical Excerpt, Corbally, 58, 145, 241, 348, 446, 540.
Medical Service, Free in New York, 357.
Medicine, Preventive, Sternberg, 193.
Melbourne, New Sewerage of, 232.
Methyl, Salycilate of, Lassere, 349.
Metropolitan Life Insurance Company, 67.
Microbe-Proof House, A., 318.
Microbes of the Glands of the Ear, 542.
Microbes, the, War with, De Schweinitz, 393.
Midwifery, Incompetent, 355.
Milk Poisoning, Douglas, 128.
Milk Pollution, Huff, 405.
Mineral Springs, Topography, Climate and, of Louisiana, Bell, 307.
Mineral Springs, Topography, Climate and, of Mississippi, Bell, 219.

Mississippi, Topography, Climate and Mineral Springs of, Bell, 219.
Mortality and Morbility Reports and Reviews, 67, 160, 252, 361, 456, 546.
Mortality in the Navy, Vincent, 348.
Mortality Statistics Abroad, 374.
Murder, Indirect, Penalty for, 359.
Myopia as the Result of Defective Light in School Rooms, Messines, 145.
Myopia, Surgical Treatment of, Panos, 147.

Nashville, The Health of, 471.
National Temperance Hospital, 65.
Navy, the, Mortality in, Vincent, 348.
Navy, the United States, Health of, 67.
Negligence, Contributory, 216.

OBITUARY:
Francis Huntington Rankin, 86.
Henry Hartshorn, 277.
Observatory, A Hygienic, 120.
Odors, A Machine to Magnify, 406.
Oedema of the Lungs, Acute, Huchard, 540.

Palestine, The Climate of, 320.
Parasites, Disease-Bearing, 380.
Pasteur Monument, 188.
Pat's Personal History, 63.
Pennsylvania, State Medicine in, 3.
Peripatetic Danger Legalized, 358.

PERSONAL:
Charles N. Hewitt, 260.
William P. Letchworth, 66.
Max von Pettenkofer, 67.
Phthisis and Insanity, The Relation Between, Irwell, 321.
Plague, Cattle, in European Russia, 56.
Plague, 563.
Plague Germ, The Bubonic, Wilson, 397.
Plague Serum, 271.
Plague Statistics, 276.
Plague, The, 373, 472.
Plague, The Oriental, 183.
Plumbers, Master, Mediaeval Methods of, 479.
Pneumatic Sleeping Cars, 141.
Pneumonia Patients, Management of, 246.
Population, Density of, 284.
Pott's Disease, Calat, 149.
Profession, Choosing a, 93.

Protonuclein, Lofton, 450.
Protonuclein, Chronic Pleurisy Treated with, 245.
Public Health, A Department of, 252.
Pye, T. E., The Incandescent Fire Mantel, 421.

Quacks, The Methods of, 231.
Quakers, the Longevity of, 218.
Quarantine and Port Sanitation, Bell, 481.

Races, Classes and Societies, The Conflict of, 479.
Racial Deterioration, Irwell, 321.
Radiography and Rheumatism, 243.
Rankin, F. H., M. D., A Memorial to, 189.
Rhinitis, Chronic, Palaez, 241.
Rickets in Paris, Beluge, 541.
Rinderpest Serum, 277.
Roentgen Rays and the Stereoscope, 148.
Roentgen Tube, the, Physiological Effects of, Stine, 142.

Sanitaria for the Treatment of Tuberculosis in Germany and Switzerland, Bryn, 427.
Sanitarian's Emblem, The, 158.
Sanitary Relation of Cleanliness, 354.
Sanitation, Aggressive, 505.
Sanitation, Port Quarantine and, Bell, 481.
Scarlatina, Disinfection of the Mouth in, 247.
School Buildings, Hygienic Demands for, Sloan, 297.
School Houses, Site, Construction and Furnishing of, 509.
School Houses, Some Brooklyn, 454.
School Houses, Ventilation of, 507.
Schools, Mental Fatigue in, 202.
Sewerage, Water Supply and, Arey, 126.
Sewerage of the City of Melbourne, 232.
Sloan, A. M., Hygienic Demands for School Buildings, 297.
"Smead System," The, 545.
Smith, S., M. D., Health Department of Greater New York, 293.
Soap, 159.
Specialism, 151.
Spitting—Cars, 251.
State Medicine in Pennsylvania, Lee, 3.
Sternberg, G. M., M. D., Preventive Medicine, 193.
Stine, W. M., Physiological Effects of Roentgen Tubes, 142.
Streams, Polluting our, 251.
Street Cleaning by Direct Labor, 477.
Substitutes, Untoward Effect of, 63.
Sweat Shops in High Places, 154.
Sweat Shops in New York, 413.
Swimming Pool for Women, 250.

Temperance, Adam Smith on, 157.
Tennessee Exposition, The, 288.
Tobacco Poison, 94.
Topography, Climate and Mineral Springs of Louisiana, Bell, 307.
Topography, Climate and Mineral Springs of Mississippi, Bell, 219.
Training School for Colored Women, 155.
Tuberculosis, Indiscriminate Slaughter of Cattle for, Law, 400.
Tuberculosis, Sanitaria for the Treatment of, in Germany and Switzerland, Bryn, 427.
Typhoid Fever, Beer and, 530.
Typhoid Fever Rates, The Water Supplies of Eight Cities in Relation to, Hill, 531.

Undertaker, An Enterprising, 315.

Vaccination, Compulsory, Bell, 19.
Valentine's Meat Juice, 247.
Ventilation of School Houses and Other Public Buildings, 509.
Vision, A Queer Fact About, 478.
Vital Statistics of the Insured, 473.
Voorsanger, Rabbi, Hygienic Self Defense, 195.

War, Losses in the, 379.
Water, Standing, Danger of, 64.
Water Supplies of Cities, Dangers of Sanitary Neglect at the Water Sheds, Mason, 385.
Water Supplies of Eight Cities in Relation to Typhoid Fever Rates, Hill, 531.
Water Supply and Sewage, Arey, 126.
Water Supply, Brooklyn's, and its Impurities, 248.
Water Supply, Brooklyn's, How Polluted, 452.
Water Supply, Brooklyn's, More About, 353.
Weather Bureau, The, in its Relation to Medical Climatology, Easterday, 313.
Whiskey in the Arts, 144.
Whooping Cough, Bromoform in, Marian, 349
Wilson, E. H., M. D., The Bubonic Plague Germ, 397.

Yellow Fever, The Bacillus, of, 276.